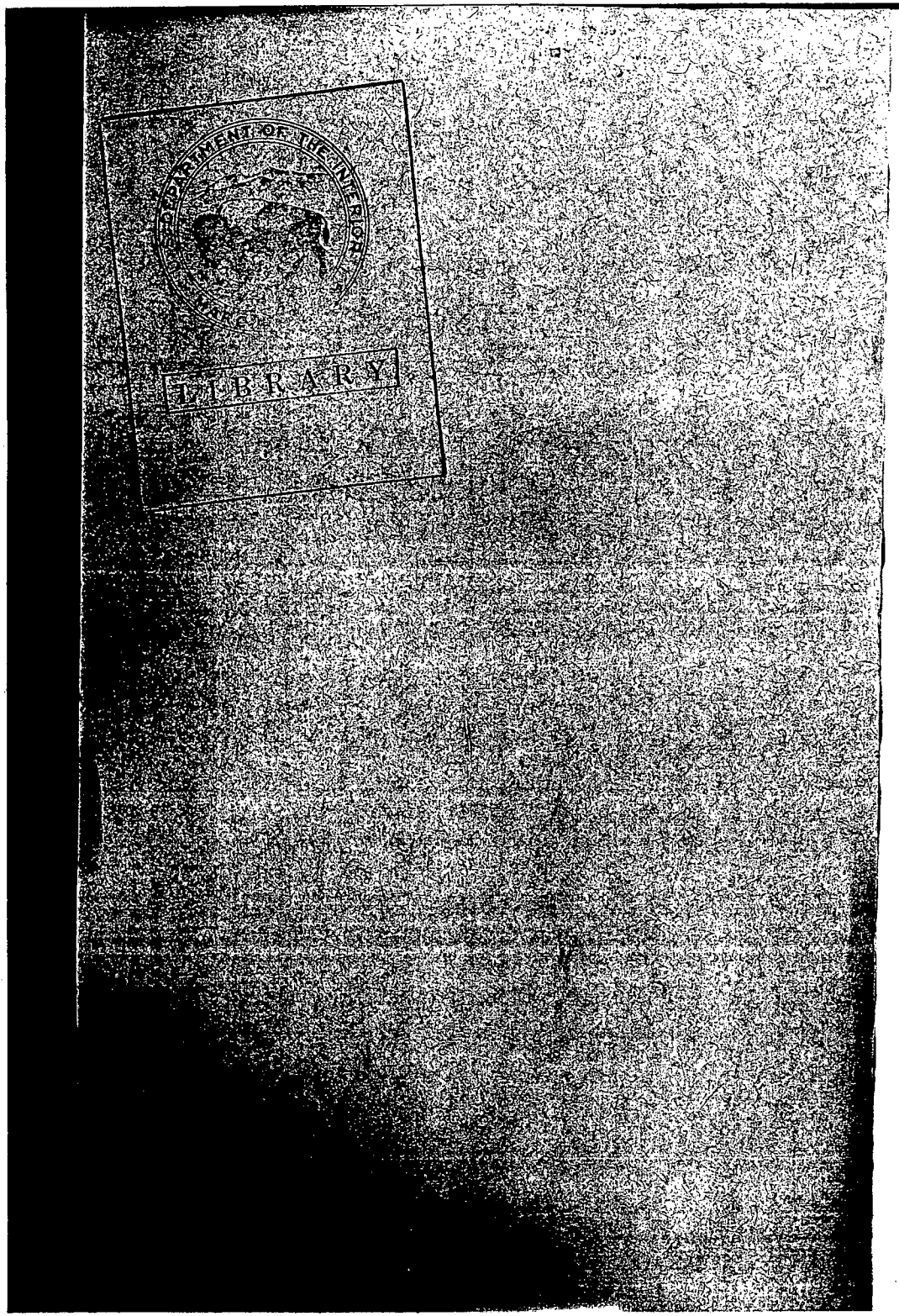

DEPARTMENT OF THE INTERIOR AND RELATED AGENCIES APPROPRIATIONS FOR 1979

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS HOUSE OF REPRESENTATIVES

NINETY-FIFTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON THE DEPARTMENT OF THE INTERIOR AND RELATED AGENCIES

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PART 10
INVESTIGATIVE REPORTS

Printed for the use of the Committee on Appropriations

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NOT FOR RELEASE UNTIL AUTHORIZED BY THE COMMITTEE

A REPORT TO

THE COMMITTEE ON APPROPRIATIONS

U.S. HOUSE OF REPRESENTATIVES

on the

REVIEW OF AUTOMATIC DATA PROCESSING IN THE DEPARTMENT OF THE INTERIOR AND U.S. DEPARTMENT OF AGRICULTURE'S FOREST SERVICE

Surveys and Investigations Staff

March 1978

(3)

NOT FOR RELEASE UNTIL AUTHORIZED BY THE COMMITTEE

March 10, 1978

MEMORANDUM FOR THE CHAIRMAN

Re: Review of Automatic Data Processing (ADP) in the Department of the Interior and U.S. Department of Agriculture's (USDA) Forest Service

By three directives all dated May 12, 1977, the Committee requested the Surveys and Investigations Staff to undertake reviews of three interrelated matters involving data processing in the Department of the Interior and the Forest Service of the USDA. Specifically, the Committee requested a review of:

1. The automated data management system for public lands involving Geological Survey, Bureau of Land Management, Park Service, Forest Service, Fish and Wildlife Service.

2. The Bureau of Land Management 7- to 12-Year ADP Plan.

3. The Bureau of Indian Affairs ADP needs and whether these needs could be met by sharing existing ADP resources.

This report contains the results of the combined investigations.

Respectfully submitted,

David A. Schmidt, Director
Surveys and Investigations Staff
House Appropriations Committee

C. R. Anderson
Chief of the Surveys and Investigations Staff
House Appropriations Committee

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SUMMARY

I. Introduction

A. Directives

The Committee, through a series of three directives, requested that studies be made of the utilization of automated data processing (ADP) equipment in the Department of the Interior (DOI) and the Forest Service of the Department of Agriculture (USDA). These directives are interrelated and included such questions as:

(1) Does the estimated $116 million Bureau of Land Management 7- to 12-year ADP plan have merit?

(2) Can there be a common computerized land data base available to all Interior and land-related agencies?

(3) Does the Bureau of Indian Affairs need its own hardware and software because of its very unique mission requirements, or can it share ADP resources elsewhere in DOI?

This report contains the results of the investigation of these matters including identification of initial potential savings in excess of $16 million and related recommendations. (See the chart on the following page.)

B. Scope of the Review

This study was basically approached from a systems analysis viewpoint of the ADP problem in DOI. To effectively answer the questions in the directives, the Investigative Staff not only reviewed the ADP policies, procedures, and practices of DOI, but also examined the entire question of what were the determinants of the growth in ADP requirements and how it compares to the management procedures followed by major private firms in controlling ADP resources.

The USDA with its highly centralized ADP operations was also reviewed as an alternative approach to the DOI's fragmented management and oversight of ADP.

The Investigative Staff obtained the users' views on ADP in DOI and USDA concerning the efficacy, promptness and price of services received from their ADP centers. This gave the Investigative Staff some useful insights into the utility of the very expensive and extensive resources available at the respective departments.

ESTIMATED INITIAL POTENTIAL SAVINGS

Savings Basis	Amount
Deferral of Equipment Replacement and Elimination of Conversion Costs on Geological Survey's IBM System	$ 6,800,000
Consolidation of DOI ADP Operations	5,000,000
Establish User Charges and Eliminate Free Service to Users	1,100,000
Elimination of National Park Service Sole-Source Contract with Boeing Computer Services	1,000,000
Establish Department Standards for Programming Languages	900,000
Combine all Payroll/Personnel Systems Into a Single DOI System	500,000
Centralization of DOI Procurement of ADP Equipment	360,000
Elimination of Geological Survey's WATSTORE System (Use EPA's STORET)	200,000
Consolidation of BLM's Procurement of Digital Analyzers	200,000 1/
Elimination of NPS' TIGRIS System	2/
Total	$16,060,000

1/ Savings already accomplished.
2/ Amount of savings undetermined.

Finally, some structural or institutional problems that were impacting the effectiveness of ADP operations not only in the DOI, but throughout the Government were reviewed; such as, the lack of standards in software (programming languages and Data Base Management Systems), hardware, noncompetitive procurements, and excessive delays in obtaining new equipment and the resultant obsolete inventory.

C. Funding of Computer Operations

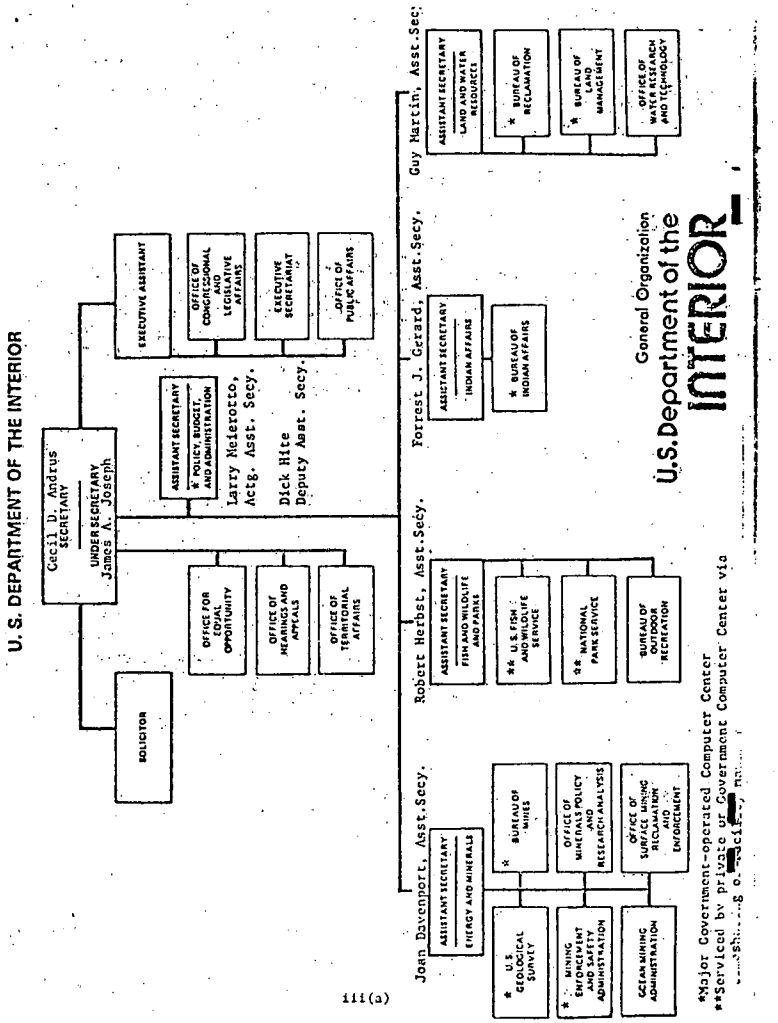
1. Department of Interior

In FY 1977, DOI expended $47.4 million for ADP services and equipment or a little over 1 percent of a total budget of $4.5 billion. By comparison, USDA spent only .8 percent of its total budget of $11.8 billion for APD services and equipment.

Within DOI, there is a tremendous variation in the intensity of ADP use as measured by the ratio of ADP budget to total budget. For example, the Geological Survey ADP intensity was 3.8 percent which appears somewhat excessive, while the Bureau of Indian Affairs intensity was about .5 percent, which appears inadequate.

Of the $47.4 million ADP expenditures in DOI, approximately $10.9 million was not charged to end users (program managers, etc.) as recommended by a General Accounting Office (GAO) task force. It is the opinion of the Investigative Staff that this lack of meaningful accountability by end users encourages proliferation of and misallocations in the use of ADP resources. The Investigative Staff estimates that $1.1 million or 10 percent of the $10.9 million now spent without accountability could be saved by requiring all end users to pay directly for services. This principle should apply to all ADP services used by an agency whether furnished by an agency computer center, other Government computer centers, or the General Service Administration's (GSA) Teleprocessing Services Program.

The attached chart reflects the location and the offices or bureaus exercising control over DOI's decentralized computers.



2. Department of Agriculture

The USDA FY 1977 budget totaled in excess of $11.8 billion. For the same period the total ADP budget was $99.3 million or .8 percent of the total budget. It appeared to the Investigative Staff that USDA was able to provide vastly superior service at lower relative costs compared to DOI.

II. Department of Interior
Automated Data Processing

A. DOI Should Consolidate Its ADP Operations

As computer technology evolved and the price of ADP equipment began dropping, the Government began experiencing a proliferation of computers across the board. ADP was no longer a luxury affordable only by the larger agencies. Now the smaller bureaus were acquiring computers too. Telecommunications made it possible for each ADP center to extend itself and meet the needs of many scattered users in remote locations.

By the 1970 time frame, some departments began realizing that a continued proliferation of computers at an increasingly larger number of locations was not very cost effective. It became evident that by sharing computer facilities through telecommunications, consolidation of these resources into a fewer number of large centers would result in much greater economies.

In the opinion of the Investigative Staff, DOI never stopped the ADP proliferation process to look at departmental consolidation and the accompanying economies of scale. Each bureau continued its individual, autonomous planning and contributed to the inefficient DOI ADP structure which is the end product of uncoordinated empire building. The result is inefficiency and duplication of systems and data bases.

The Investigative Staff points to the ADP development philosophy at USDA as an example to be followed by DOI management. USDA's consolidation of ADP services into four major centers, and its trend toward distributed capacity (as outlined in the 1977 USDA ADP Management Plan) is effectively meeting the needs of its users. There can be no question that a similar approach at DOI would permit the department to process larger workloads, with better turn-around times, at significantly less cost than is possible now. Additional details are supplied in the hardware overview, Section V of this report.

DOI should implement the intent of its ADP Strategy Plan to establish departmental service centers and phase out

the fragmented ADP operations. This would mean consolidation of the 21 ADP centers (as identified in the January 16, 1977, letter from the Office of ADP and Telecommunications Management) into no more than 4 or 5 centers. It would also mean consolidation of eight separate telecommunications networks (which now support the existing centers) into one shared departmental network. This consolidated computer/telecommunications utility would result in very significant savings to DOI of $5 million in the first year alone. The figure is derived as follows:

$1.1 million	-- phase out Washington Computer Center
.8 million	-- defer BIA computer in Albuquerque
1.6 million	-- consolidation of personnel and support activities
1.5 million	-- consolidated telecommunications
$5.0 million	

The Investigative Staff suggests that DOI use USDA's 1977 ADP Management Plan for assistance in planning the consolidation. Furthermore, DOI could greatly enhance its in-house capability by availing itself of the technical expertise at the Federal Computer Performance Evaluation and Simulation Center to perform any related analyses, evaluations, or requirements definitions.

B. Central Management of ADP and Telecommunications is Weak and Should be Strengthened

Early in the review, it was noted that some of the observed problems relating to DOI were generic in nature, Specifically, the cause of these problems was the impact of PL 89-306, the Brooks Act, and its lack of implementation by certain central agencies of Government--Office of Management and Budget (OMB), National Bureau of Standards (NBS), and GSA. The Investigative Staff found that many of the difficulties in the management of ADP resources in DOI existed (1) because of inaction or inappropriate action on the part of these central agencies and (2) because of a general lack of interest by officials within the Office of the Secretary.

This lack of interest resulted in an emaciated departmental Office of ADP Management and Telecommunications. Consequently, the office's ADP strategy plan became ineffective and was virtually abandoned.

Each bureau within DOI develops and implements its own ADP requirements with a token gesture of cooperation with the Office of ADP Management and Telecommunications. In fact, most bureaus circumvent the objections or corrective action by this

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office regarding computer resources. In short, each bureau has its way. This will continue, unless the Secretary of the Interior gives his Office of ADP Management and Telecommunications the authority and sanctions it needs to achieve its objective and goals. Further, centralized ADP management needs: (1) top management involvement in the control of ADP resources, (2) overall ADP planning, and (3) sufficient staff.

To correct this situation, the Investigative Staff suggests the Committee may wish to consider instructing the Secretary of the Interior to restructure oversight of ADP resources as follows:

-- Establish an ADP Executive Review Board with total authority for ADP resources, present and future.

-- Consolidate and adequately staff the computer procurement and management function in the Office of the Secretary for the Department of the Interior.

-- Assign responsibilities for all negotiations with vendors including benchmarks to a central ADP organization in DOI

-- Assign management control over all funds (appropriated directly or reimbursed) for new computer acquisitions (lease or purchase) to the Office of the Secretary.

-- Preclude bureaus from obligating funds for ADP personnel, contracts, communications, or teleprocessing service program (TSP) except as provided for and approved in the ADP budget (Exhibit 43 A of the President's Budget) or if approval is granted by the Congress for specific reprogramming.

The Investigative Staff estimates annual potential savings of the above actions at 8 percent of the dollar value of ADP procurements processed annually. Specifically, in FY 1978 $5.3 million in procurements could result in expected lower prices of $450,000, less cost of net increase in staffing of $90,000, or $360,000.

C. Bureau of Indian Affairs

1. Organization

The organizational structure of the Bureau of Indian Affairs (BIA) is made up of a headquarters office in Washington, D.C.; a central office in Albuquerque, New Mexico; and 12 area offices--11 west of the Mississippi and one in Washington, D.C.

2. Inefficient and Obsolete Hardware At Albuquerque Computer Center

To serve the informational needs of this organizational structure, there is a CDC 3100 computer series located in Albuquerque, New Mexico. Because of the "antiquity" of this computer series, together with inefficient usage, the requirements of financial applications are minimally satisfied, whereas most of the functional applications are not.

3. Inefficient Programs Result in Untimely and Inaccurate Management Information

The lack of an ADP developmental plan for the use of the CDC 3100 computer series has caused BIA one continuous problem. The original intent for the computer series in 1966 was for functional applications. But the only one placed on the system at that time was the land records system, which was done inefficiently and ineffectively. The same statement applies to the Tribal Enrollment System as well as a few other partial, later applications.

The main use of the CDC 3100 scientific computer series is financial applications. Currently, these applications are fragmented and are written in antiquated lines of program code. As part of the procurement request that is pending, BIA has proposed a literal conversion of these lines of code to modern ANSI COBOL (a higher level language code), with a minimum of redesign, at a cost of $300,000.

The Investigative Staff recommends that BIA not expend any funds for conversion but, rather, expend the funds for a redesign of the current automated applications, except payroll. Payroll is excepted since DOI directed the Bureau of Reclamation to design and development a departmentwide payroll/personnel system which can operate on any modern computer.

The Investigative Staff is of the opinion the Secretary of the Interior should direct BIA to cooperate in this payroll design. If this is done, it would be practical for the Assistant Secretary for Indian Affairs to assign a full-time ADP staff member and one full-time personnal specialist from BIA to Denver to work with the payroll task force and, thus, assure the satisfaction of BIA's payroll requirements. This will cost less than having BIA redesign its own payroll system.

Currently, BIA has a problem in deciding the priorities for financial and functional applications. This problem appears to stem from the fact that the ADP center is under the jurisdiction of the Office of Administration, where financial applications are a prime concern. The Investigative Staff

recommends that the entire data processing function be elevated to the status of an office. This office can establish schedules and priorities without allegiance to any one particular office, division, or field office within BIA. Further, it is recommended that this office establish a fee schedule for all services rendered. This would eliminate the arbitrary assessments that are now levied by the central office on the program managers. These assessments have been a source of much consternation to them.

Effective automated functional programs are essential to BIA in the achievement of its mission-oriented goals. The Investigative Staff reviewed several of the current automated systems: Tribal Enrollment, Investment, Education, BIA Land Records, and Billings Area Office Land Records.

The Investment program involves about $700 million of Indian money which BIA invests for Indians, thus a breakdown in the CDC 3100 system would constitute a potential loss in revenue to the tribes from investments. When investments are curtailed potential losses could range from $1,700 to $7,000 per day per investment. The current fragmented system is scheduled for redesign and implementation.

A major part of the BIA budget is allocated to the education and training of Indian people. Yet, despite the resources given to the BIA Office of Education, this office does not have a viable integrated education system. The Investigative Staff strongly recommends that the Assistant Secretary for Indian Affairs permit this office to have a separate ADP budget and use it as they see fit to implement the recommendations made in the January 1977 GAO report to develop a management information system for assessing educational needs of Indian students.

4. BIA's Land Record System

The Land Record System is one of the most important systems within the BIA because it must keep track of Indian lands and natural resources held in trust by the U.S. Government. This is one of the prime reasons for the establishment of the BIA. Yet, despite its importance, the BIA has not come up with a viable system that can respond to the informational needs of the tribes, Federal agencies, State and local governments, and the Congress. The BIA realty people, both Indian and non-Indian, have no confidence in the BIA ADP staff to satisfy their requirements.

This same problem exists in the National Resource Information System which, as yet, has not been automated. The only effort toward automation of a National Resource Information System has been made by the Colville Indian Reservation.

The Investigative Staff suggests that the Committee may wish to direct the Assistant Secretary for Indian Affairs to have a complete study made of the Colville system before expending any funds on further development, with the results of this study to be reported to the Committee, together with BIA recommendations based thereon.

5. Billings Area Office (BAO) Land System--A Hope for the Future

Because of the problems in the BIA Land Record System, the BAO was chosen to develop a minicomputer pilot project for land records. The Investigative Staff visited the BAO and reviewed its Land Records System, which is entitled "Integrated Records Management System" (IRMS). This system is accomplishing the objectives for which it has been designed. Earlier skepticism is waning as the users become more experienced with the system and become involved with the system through user group participation and training.

The area office runs this system on a sophisticated minicomputer with five people.

The Investigative Staff suggests the Committee may wish to direct the Assistant Secretary for Indian Affairs to evaluate and consider adopting the Billings Area Office Integrated Records Management System rather than expend further funds for any other land records information system.

6. BIA Management Practices

The effectiveness of BIA in achieving the objectives and goals of its mission is being thwarted by its management deficiencies. Within the level of top management, the most pronounced problems are the high rate of turnover and a breakdown in communications.

Other problems in management have to do with personnel. In the area of ADP, there is a great divergence between the really skilled versus the marginally skilled data processing professional. This void has been created by the Indian Preference Act. Most of the skilled data processing professionals have left BIA with the result that the remaining few are inadequately motivated and spread too thin. The Indian Preference Act has made it difficult to fill vacant positions with the best-qualified people and internal mobility and flexibility suffer as in many instances non-Indians cannot be transferred to new positions.

7. ADP Modernization Plan

The solution to BIA's problem for timely and accurate management information is its ADP Modernization Plan.

Phase I of the plan, which proposed that BIA acquire a modern computer with telecommunication capabilities, is to solve immediate problems and Phase II is to solve long-range problems.

Regardless of where the central or host computer is located, BIA will have to redesign the current administrative and functional applications that are run on the CDC computers and to design the remaining applications that have been identified in the bureauwide ADP Requirements Study (BARS).

The Investigative Staff found in its review that there were several studies, specifically the Navajo Area ADP Requirements Study (NAARS) and the study of the Community Service System (CSS), that were duplicating the BARS study. The NAARS study was terminated when BIA realized the duplication. The Investigative Staff believes that BARS adequately defines the informational requirements of the BIA at least for the immediate future. Therefore, the Investigative Staff suggests the Committee may wish to instruct the Assistant Secretary for Indian Affairs to preclude the spending of any funds on computer programming until such time that the administrative and functional applications defined in BARS have been integrated with the Billings Integrated Records Systems and assigned clear priorities.

8. Alternatives for Computer Effectiveness

The Investigative Staff requested BIA to submit alternatives and cost estimates for the implementation of Phase II of the ADP Modernization Plan. The three options submitted were: (1) a new in-house large computer; (2) utilization of a computer in another bureau; and (3) utilization of a commercial teleprocessing service program. Each of these options includes estimates for intelligent terminals at the ADP center area and agency offices and contract support for 5 years to develop the 19 major applications identified in the BARS study.

The Investigative Staff recommends that the Committee consider funding the development of BIA's 19 major applications over a 5-year period. These applications, with good documentation, should be developed by contract, using standard higher-order languages and be portable to any computer system.

The Investigative Staff recommends that the Committee consider directing the BIA to utilize the services of the Bureau of Mines (BM) to meet its computer requirements for a period of 2 years. The Bureau of Land Management (BLM) and the Bureau of Reclamation are also alternatives. The additional computer and memory cost to BM to provide the service to BIA will be under $100,000 per year. No additional personnel would be needed at BM to operate the computer. Additionally,

because of economies of scale, the unit cost per "job" for all BM's computer users would drop from $2.60 to $2.08. To enhance the BIA's computer effectiveness, the Investigative Staff recommends that the Committee consider funding for a minicomputer in the ADP center and a minicomputer in each of the 12 area offices and 5 title plants. These minicomputers should satisfy the local requirements of each of the areas identified above. Further, the minicomputer should be tied into intelligent terminals in their respective agency offices.

The Investigative Staff estimates that these steps should result in a net savings of $941,000 over a 2-year period based on the BIA Phase II estimates.

Conclusion

The BIA cannot operate effectively with its current hardware and automated administrative and functional applications. The Investigative Staff believes that the achievement of BIA's mission can be enhanced by modern computer technology and telecommunications. The Investigative Staff feels that the utilization of the modern computer can accelerate BIA's understanding of this technology.

The concept and use of minicomputers and intelligent terminals is exemplified in the Billings Area Office. Since this area has over 5 years' experience in the utilization of this concept, the Investigative Staff recommends that BIA take advantage of this experience.

D. Geological Survey

1. History of ADP and Present Organization

The Geological Survey (GS) has been using electronic computers since the early 1950's. All charges for computer services are billed directly to the end users on a service rendered basis. This permits the program officials to compare what they are getting for their money with alternative uses for the funds.

A very important vehicle that is used by the GS to assure good user relations is the computer liaison committee. This committee has a broad charter and is very influential regarding the level and quality of ADP services. The Investigative Staff recommends all DOI bureaus adopt some system for user participation in ADP matters.

2. Why are the Two IBM Systems Overloaded While the Six Honeywell Multics Systems Are Underutilized?

In Reston, Virginia, at the GS there are two modern IBM 370/155 computers that are working at or near capacity. In

legal challenges, and unhappy vendors. The cause for this disarray was due primarily to permitting each bureau to conduct its own ADP procurement. However, the problem has been resolved in dramatic fashion by the implementation of a centralized ADP procurement operations.

The Investigative Staff considers the Department of Commerce centralized ADP procurement operation to be worthwhile of study and consideration by DOI.

C. National Institutes of Health (NIH)--A Model Computer Facility

During the course of this study, many officials in different Government agencies and private industry recommended that the Investigative Staff review the computer utility operated by NIH. The reason for this recommendations is that they consider it a model to be emulated by other Government computer centers.

The computer utility at NIH enjoys an enviable reputation among data processing professionals. Nonusers join the actual NIH ADP users in praising the system. The Investigative Staff reviewed the NIH operation and determined it achieves the economies of scale philosophy through the distributed capacity concept which permits large, medium and small computers to operate as stand-alone devices or to operate in conjunction with each other via a telecommunications arrangement. Consequently, NIH can provide services much more cheaply than the users can on their own computer or through a service bureau. Additionally, NIH even provides some services not available on the outside. NIH is able to offer more service and capability, while lowering its reimbursable billing rates. For example, in 1970, NIH charged $175 per hour. Seven years later, the rate was $72 per hour.

Another reasons for NIH's success is that it trains, educates, and supports its users. It provides this support so the users can make the most effective use of the resources available.

These resources include four large identical CPU's, tied together via a combination of hardware and software. (This concept is known as "loose coupling.") Under this concept, a failure of one CPU may degrade operation, but the degradation is so subtle, that the user is not aware of the failure.

While the cost of computer hardware goes down, the cost of software and benchmarking skyrockets. The Investigative Staff suggests that a knowledgeable organization such as the Federal Computer Performance Evaluation and Simulation

Center be tasked to develop practical benchmark requirements and new criteria which could provide the Government with a 90 percent confidence level for perhaps only 10 percent of the cost of present benchmarks.

Additionally, the same study should address (1) the elimination of some criteria, (2) the minimizing of others, and (3) the simultaneous implementation of those which lend themselves to simultaneity. An example of (1) would be to permit established computer mainframe vendors immediate access to the GSA general schedule. An example of (2) would be to eliminate all "desirable" features from an RFP and make all features "mandatory." This would greatly shorten the proposal evaluation process. An example of (3) would be to prerelease a functional version of an RFP, creating an overlap process which would shorten the time between technical release and the due date.

All of these would shorten the procurement process so that the Government's ADP inventory would look more like the 80 percent new/20 percent old equipment ratio of the private sector than the existing Government ratio of 80 percent old/20 percent new.

IV. ADP Procurement and Standards

A. Obsolescence of the Government Computer Inventory

Government procurement procedures involve an inordinate investment of personnel, time, and money. A typical procurement cycle for a major system will last 2 years--longer, if a vendor should protest. Because of these procedures, the equipment received is already obsolete. (In the rapidly changing computer industry, 3 years represents a point of obsolescence.)

The Investigative Staff has been advised by the mainframe vendors that their generous discounts to the Government reflect obsolescence. The same vendors have also proferred that when a procurement specifies a $1 million plus benchmark, the cost is included in the delivery price.

B. Practices and Problems

The Government Operations Committee, through its Subcommittee on Legislation and National Security, conducted 3 days of hearings on June 28 and 29, and July 1, 1976, in which procurement and utilization of ADP equipment under the Brooks Act were reviewed.

At the hearings, testimony was given by representatives of OMB, GSA, NBS, and GAO. Representatives of the computer

industry testified as to the industry's position regarding the implementation of the act. The hearings concluded that, overall, the act--while providing significant benefits--has neither been satisfactorily administered nor effectively implemented. The biggest complaint is that only a small number of ADP procurements are fully competitive. If this practice is allowed to continue, the Brooks Act will be seriously jeopardized, and its intent of saving millions of dollars annually will be lost.

On one hand, the Investigative Staff feels that vigorous application of the Brooks Act by the central agencies should reduce the overall cost of ADP services to the Government.

On the other hand, literal, rather than judicious application of the act can result in unnecessary costs and delays. For example, in the USDA there are two outstanding regional computer centers located in Fort Collins, Colorado, and Washington, D.C. The first of these is a Sperry Univac 1142 installation which has just recently become effective. The other is an IBM 370/168 installation that is running smoothly. Both of these systems are undergoing recompetition with resultant costs to each vendor ($500,000 to $700,000) and the Government, not to mention possible disruptions and inconveniences to the users. No user interviewed really could see benefits coming from these particular recompetitions. Open competition will have been the "order of the day" for the New Orleans and Kansas City Computer Centers. The Investigative Staff endorses such action. However, with respect to the other two centers, since there is no requirement that they all be identical, it is the view of the Investigative Staff that the USDA and particularly the Forest Service would be better off if GSA left "well enough alone" and did not mandate recompetition of these interim procurements.

V. Hardware

A. DOI Overview

The summary for this section is combined with and can be found in Section II A relating to consolidation of ADP in DOI.

B. Standards

It is the consensus of every vendor and computer organization interviewed by the Investigative Staff that the NBS has failed in establishing meaningful standards in both software and hardware areas. Most of the meaningful standards, which have been achieved to date, have been brought about by a major vendor, whose products (hardware and software) have a large number of users.

It is the view of the Investigative Staff that at the present time, there is no means for encouraging the private sector to voluntarily establish hardware standards. If anything, these vendors will resist the development of standards for fear that such will restrict their own option and perhaps even disclose some of their future product trends.

Perhaps the largest area in which standards are lacking is in software. For all practical purposes the Government does not have standard high-level computer languages that would permit software written for one machine to be used on a machine manufactured by a different vendor. The August 1977 GAO report highlights this fact by stating that the lack of standards in software leads to conversion, the cost of which is $400 million annually with $100 million wasted. This results when agencies replace older computing equipment with new equipment from a different vendor, as is happening in DOI.

While there is little that the Government can do in correcting the lack of standardization in the past, much can be done to establish standards for the future. The Government can establish standards now, to become effective in the future. In this manner, all vendors could design towards those goals without impacting any equipment currently in production.

C. Economies of Scale

When two data processing centers are consolidated, the operating organization gets more computer per dollar with a larger system. The physical plant, software, overhead, and personnel cost will all be relatively less.

One of the most dramatic examples of the concept of economies of scale was observed by the Investigative Staff during its visit to the Fort Collins Computer Center (FCCC) of USDA. At FCCC, the former computer system was replaced by a significantly larger system to accommodate present and future workloads. There was only a 2 percent increase for the monthly rental of the new system, and an incredible 300 percent increase in workload throughput. Fort Collins converted from a Univac 1108 in 1976, to a dual Univac 1142 with virtual memory. This was done on an interim delegation of procurement authority.

D. Minicomputer to Balance Large Systems

The minicomputer, in contrast to the full-sized computer, occupies a space of only several cubic feet. While it resembles its larger counterpart, in function, its memory capacity is generally much smaller.

The big payoff comes in much higher reliability, much lower power consumption, smaller physical size, and much lower

initial cost. Over the past 9 years, the cost has dropped at such an incredible rate that the purchase of the minicomputer becomes a worthwhile investment for dedicated applications or for a tie-in to some larger system. In April 1976, a GAO report indicated that minicomputers could enhance productivity by performing some functions with simpler operating software and lower basic overhead. Minicomputers also permit the automation of many functions and processes without tying up a large central processor. A good example of this is the automated Land Record System of the Bureau of Indian Affairs which was implemented in Billings, Montana. This stand-alone system, costing a fraction of the main ADP center in Albuquerque, has demonstrated the feasibility of meeting certain needs of the Billings Area Office in a more timely manner at a much lower cost.

The minicomputer has further proved itself in the telecommunications environment by serving as a front-end processor (FEP) to a large computing center; i.e., the interface between communications and computing. The lower priced minicomputer now takes over many expensive, time-consuming, routing functions from the main CPU, and frees up the latter for prime processing.

By the early 1980's, a computer with the capacity of an entire minicomputer, as we know it now, may be smaller than a pack of cigarettes.

VI. Software

A. Data Base Management System

Data Base Management System (DBMS) is referred to as a software system that manages and maintains data for the purpose of being usable by multiple computer programming applications. It organizes data elements in some predefined structure and retains relationships between different data elements within the data base.

The depth of knowledge and experience for DBMS within DOI is very shallow, specifically, in the area of total cost, which includes the purchase of a DBMS package, additional equipment, and personnel cost.

The Investigative Staff recommends that a Data Administrator and a Data Base Administrator be appointed to the Office of the Secretary, for ADP management. This individual would be responsible for assuring that the DBMS packages selected are portable to other computer configurations. The Data Administrator and the Data Base Administrator would also be responsible for training. All persons within DOI who are involved in DBMS should learn what DBMS consists of and what it can and

cannot do. This knowledge should be obtained through one of the many generalized seminars now being offered and not through a DBMS vendor seminar.

Once the knowledge is acquired, DOI should enter the planning phase to determine the DBMS packages that will satisfy the requirements of the entire department. Once the planning phase is complete, the Data Administrator and the Data Base Administrator would evaluate the products offered by the many DBMS vendors.

The evaluation phase and final selection is very important. Once the selection is made, the Department becomes committed to specific vendors. Therefore, the Investigative Staff strongly recommends that DOI have DBMS standards, either its own or CODASYL.

B. Higher-Level Languages

Languages that do not require the user to have a knowledge of very difficult computer languages and are independent of a particular computer are termed higher-level languages. There are more than 165 higher-order languages. Among these are COBOL, FORTRAN, PL-1, BASIC, and ALGOL 68. These languages have been standardized by the Conference on Data System Languages (CODASYL) group. All but ALGOL 68 have been approved by the American National Standards Institute (ANSI).

The purpose for standardization is to give flexibility to languages to be run on any type of computer hardware. Therefore, the Investigative Staff recommends that all application programming within the department be done in accordance with ANSI and/or CODASYL standards. Further, the Department should also make it a policy to keep itself abreast of extensions and revisions made to standardized programs by ANSI and the CODASYL groups in order to assist its bureaus in the implementation of these extensions and revisions.

For portability of computer programs between disparate computers, the Investigative Staff recommends that the Secretary of the Interior direct that only ANSI standard, higher-order languages, without use of manufacture extensions, should be used. This would apply to any new applications or major modifications to existing programs. These departmental standards should be reviewed and modified every 5 years to assure currency with the "state of the art." As the NBS approves a new release of a language, this should be promptly incorporated into DOI standards. DOI should develop and document a common library of computer programs that all agencies can share, as envisioned in an ADP sharing plan now under study. Estimated annual savings should be $900,000 in conversion cost avoidance.

The Investigative Staff strongly recommends that DOI consider using a common network for achieving consolidation of the DOI computer utility. The Investigative Staff believes that this concept can be implemented by making use of one of the commercial approaches to distributed processing and networking. As the Investigative Staff understands it, the layered software technique can be used. One possibility for achieving consolidation of the DOI computer utility would be to use existing GS computers as a proposed "backbone" for a DOI-wide network and the layered software as a means for achieving the required connectivity.

D. Data Security

Within DOI, most of the information needed for fulfilling administrative and functional responsibilities are stored on computer-related devices. The need to protect this information and to update it accurately is self-evident. Any damage, regardless of source, must be prevented as far as it is humanly possible.

OMB has recently promulgated a policy on security in which it states that the head of each executive branch, department, and agency is responsible for assuming an adequate level of security for all agency data, whether processed in-house or commercially. The policy further states that GSA is to develop guidelines for physical security, the Department of Commerce for standards, and the Civil Service Commission for different levels of security for ADP personnel.

The Investigative Staff recommends that DOI's security plan for its network requirements include the development of an evaluation and audit procedure for insuring the security and integrity of all of its data. The responsibility for development and implementation of audit procedures should rest with DOI's Office of Audit with consultation from the Office of ADP Management.

VII. Telecommunications

The proliferation of ADP systems in DOI has an associated proliferation of telecommunications systems. DOI has no less than eight separate networks, five of them centered in Denver, Colorado. Each of these networks independently serves hundreds of users in the same scattered geographic areas.

Perhaps typical of the thinking that pervades the disparate planning in the various DOI bureaus is an RFP issued by the Bureau of Reclamation with a response date in December 1977. This RFP is for a study and analysis of the bureau's telecommunications and ADP requirements for the decade starting in 1980. There is no reference to departmental communications

but rather an individual network that will meet the Bureau of Reclamation's own needs. In the opinion of the Investigative Staff, the Bureau of Reclamation and other DOI bureaus cannot economically justify their own networks. Vast economies of scale can be achieved with consolidation.

For example, if a terminal requires more than 3 hours of connect time per day, it costs less to lease a dedicated line for 24 hours per day than to pay the dial-up costs. Assuming 4 hours of line occupancy, the other 20 hours are available to be shared by others users--at no extra charge for the line.

In 1972, GSA performed a study and made recommendations for the consolidation of the computer facilities in the Denver area including the DOI bureaus. The report also addressed the consolidation of the associated telecommunications requirements. The DOI bureaus responded negatively or not at all to the report.

In the summer of 1976, a Washington-based consulting firm, Information and Communications Applications, Inc. (ICA), delivered a final report addressing the feasibility of consolidating communications systems within DOI. ICA had been awarded a contract by the Office of Automated Data Processing and Telecommunications Management during the previous year. The study addressed the fragmented approach, i.e., agency oriented, that had been used to develop separate networks, each tailored to meet individual needs.

The bottom line in the consultant's report projected a savings of $45 million over the next decade between the consolidated approach and the fragmented, individual approach. The Investigative Staff considers ICA's projections, which amount to over $4 million per year on the average, to be quite realistic.

DOI, because of the lack of sufficient control over the autonomous bureaus, has virtually shelved the 1972 GSA report and the 1976 ICA study.

The Investigative Staff has studied the various DOI requirements, and considered several alternatives for implementing consolidation. Starting with an annual current savings of $1.5 million, this is expected to double to $3 million in 5 years and to redouble to $6 million in 10 years. (These figures are present value and do not take inflation into account.)

The Investigative Staff recommends that the Committee consider directing the Secretary of the Interior to initiate planning of the consolidated telecommunications system immediately. It is also the view of the Investigative Staff that all the details cannot be available until the consolidated ADP plan is

available. However, working with the expertise available in the Federal Computer Performance Evaluation and Simulation Center, both plans can be formulated in a timely manner and would establish a new beginning for the Office of ADP and Telecommunications and a model of efficiency within DOI.

xxx

I. INTRODUCTION

A. Directives

The Investigative Staff received three directives relating to automated data processing (ADP) in agencies within the Department of the Interior (DOI) and the Forest Service of the Department of Agriculture (USDA). Because of the interrelationship of the three directives and as they all contain a common thread--the application of computer and information systems technology--they were consolidated for the purpose of the investigation and reporting.

Specifically, one directive requested the Investigative Staff to review automated data management systems dealing with public lands managed by the Fish and Wildlife Service, Bureau of Land Management, Geological Survey, National Park Service, Bureau of Mines and the USDA's Forest Service. The investigation was to determine whether a common data base could be established to permit all agencies to have access to the data.

The second directive requested an investigation of the Bureau of Land Management's proposal for a 7- to 12-year program to complete an automated data management program. The investigation was to focus on the reasonableness of the program costs and whether the program would meet the needs of the agency in a timely fashion.

The third directive requested an investigation of the ADP system of the Bureau of Indian Affairs. The study was to examine whether a separate system is necessary, the adequacy of the current system, the accuracy of the cost estimate for future expansions, and whether other DOI bureau systems could be shared to fill the Bureau of Indian Affairs' requirements.

As the Investigative Staff began its review, it found that there had been a proliferation of ADP expenditures and equipment in DOI in recent years.

The table which follows is a summary of the 21 computer centers in DOI. It identifies the various bureaus and 36 mainframe computers they are operating as of January 1973.

DOI BUREAU COMPUTER CENTERS AND MAINFRAME CPU'S

Bureau	Location of Center	Mainframe
Reclamation	Denver, CO	CDC Cyber 70/74-28
		CDC Cyber 70/74-16
	Boise, ID	IBM 1130
		Univac 1004
	Sacramento, CA	Daconics 3501
		IBM 1620
		NCR 2000
	Phoenix, AZ	HP 2100
		HP 21168
	Salt Lake City, UT	Mohawk 2100
		Mohawk 2400
		HP 2100
Fish & Wildlife	Laurel, MD	IBM 370/115
	Ann Arbor, MI	IBM 1130
	Columbia, MO	PDP 12
	Denver, CO	HP 2100 A
		WAN 220B
Geological Survey	Sioux Falls, SD	Burrough 6700
		Univac 9030
	Rolls, MO	SEL 86
	Menlo Park, CA	Honeywell 68/80
	Denver, CO	Honeywell 68/80
	Reston, VA	Honeywell 68/80
Land Management	Denver, CO	Burroughs 5500
Mining Enforcement and Safety 1/	Denver, CO	Honeywell 66/60
Indian Affairs	Albuquerque, NM	CDC 3150
		CDC 3170
		MOH 24091
Washington Computer Center	Washington, DC	IBM 360/65
		IBM System 3/15
		SDC 200
Mines	Denver, CO	Burroughs 6700
	Spokane, WA	CDC 3200
	Albany, NY	Interdata 7/16

1/ Now part of the Department of Labor.

B. Scope of Review

The Investigative Staff reviewed overall policies, procedures, and practices followed by DOI and USDA with emphasis on the practices followed in dealing with ADP operations, and held discussions with representatives of other Government agencies who have oversight responsibility in related areas. Also interviewed were several private and Government consultants who had conducted studies of DOI computer systems, and related communications.

Interviews were conducted with Washington headquarters personnel in the Bureau of Indian Affairs, Bureau of Land Management, National Park Service, Fish and Wildlife Service, Bureau of Outdoor Recreation, Geological Survey, Bureau of Mines, Mine Enforcement and Safety Administration, Bureau of Reclamation, Forest Service, Environmental Protection Agency, National Oceanic and Atmospheric Administration, Defense Communications Agency, Defense Mapping Agency, Department of the Navy, General Accounting Office, General Services Administration, the Federal Computer Performance Evaluation and Simulation Center, and the Office of the Secretary of Commerce, as well as the Census Bureau and the National Bureau of Standards.

Personnel in field offices of DOI were interviewed, as well as personnel in field offices of USDA, including the Farmers Home Administration, Agricultural Stabilization and Conservation Service, Forest Service, Office of Audit, Federal Crop Insurance Corporation, New Orleans Computer Center, Fort Collins Computer Center. St. Louis Computer Center, and Kansas City Computer Center.

Interviews were also held with representatives of the Burroughs Corporation; Cullinane Corporation; Digital Equipment Corporation, Honeywell Information Systems, Inc.; Informatics, Inc.; International Business Machines Corporation, Incoterm Corporation, Software Module, Inc.; Tektronix, Inc.; Sperry Univac Federal Systems; Control Data Corporation; Earth Satellite Corporation; MRI Systems Corporation; and Cincom, Inc.

The Investigative Staff interviewed officials in area offices, computer centers, regional offices, and private industry offices in numerous locations around the country. Over 600 officials in the Government and industry were interviewed.

A questionnaire survey of users of USDA and DOI computer centers was made to obtain the users' opinions of those facilities. In addition, the Investigative Staff found that there were no generally accepted standards to measure performance and efficiency of computer centers. Consequently, the

Investigative Staff developed a pilot methodology to compare and evaluate computer center operations among and within DOI and USDA.

Finally, it was determined that in DOI certain key applications such as payroll (and related administrative procedures), digital mapping, remote satellite sensing, identification and inventory of land and natural resources, and the resultant data base development were causing requirements for computers and related facilities to expand significantly. The Investigative Staff reviewed methods that could be used in achieving efficiency in these functional application areas as alternatives to acquiring computer equipment and personnel proliferation.

C. Funding of Computer Operations

1. Department of the Interior

The DOI FY 1977 appropriations totaled in excess of $4.5 billion. For the same period, the total obligations for ADP systems were $47.5 million or a little over 1 percent of the total budget.

This statistic is a good starting point for understanding AOP in an organization as it measures to some degree the intensity of its use in performing the organization's mission. The Investigative Staff's analysis of ADP costs for individual agencies within DOI, as contained in the chart below, shows on the average the department spent 1 percent of its budget for ADP. However, there is a wide range of ADP intensity with the Geological Survey having the highest costs, spending almost 3.8 percent of its total budget for ADP compared to the Bureau of Indian Affairs (BIA) spending about .4 percent of its total budget. The actual lowest proportion of total funds spent on ADP was attributed to the Bureau of Outdoor Recreation with less than .1 percent. Either this bureau has little need for ADP or has just not faced up to its information needs.

To a considerable extent, this disparity between BIA and Geological Survey reflects a quantum jump in technical capability and degree of "rank and file" use of computers as a working tool. It also may be indicative that Geological Survey was overcomputerized and perhaps had too much capacity for its own needs. On the other hand, it appears BIA was not spending enough, given its wide ranging needs, and lagging behind the "state of the art" in utilizing the computer as a tool to assist management and their constituency.

	DOI FY 1977 Funds		
	Total ($000)	ADP ($000)	Ratio (%)
Bureau of Land Management	$ 437,657	$ 5,232 2/	2.2
Bureau of Outdoor Recreation	544,776	203	1/
Fish and Wildlife Service	186,717	2,041 2/	1.1
National Park Service	492,658	3,151	.6
Geological Survey	420,685	15,913	3.8
Mining Enforcement and Safety Administration	99,301	2,509	2.5
Bureau of Mines	186,556	4,115	2.2
Bureau of Indian Affairs	852,554	3,713 2/	.4
Bureau of Reclamation	1,096,599	6,721	.6
Other, including the Office of the Secretary	259,599	3,912	1.5
Total	$4,577,102	$47,510 2/	1.0

1/ Less than one-tenth of one percent

2/ Approximately $11 million of the total of $47.51 million represents expenditure for ADP where end users are not billed for services rendered.

The following table represents an overall ADP profile of DOI for FY 1977. It shows, for the department and each bureau or office, the computer systems in the department, central processing units, and work years.

DOI FY 1977 ADP PROFILE

Office or Bureau	Central Processing Units		Work Years
	Special	Total	
Office of the Secretary	-	3	67
Fish and Wildlife Service	-	5	70
Geological Survey	22	34	209
Bureau of Indian Affairs	-	3	101
Bureau of Land Management	-	1	112
Mining Enforcement and Safety Administration	-	1	54
Bureau of Mines	16	19	168
National Park Service	-	0	64
Bureau of Outdoor Recreation	-	0	8
Bureau of Reclamation	11	30	188
Water Research and Technology	-	-	-
Departmental Totals	49	96	1,041

In 1973 a task group of very highly qualified professionals was commissioned to study the problems of management control of ADP activities and make recommendations to the General Accounting Office. Their initial effort addressed the cost accounting and cost control processes as a critical central element of management control. Specifically, this group addressed the cost assignment to end user units or organizations of data processing and communications operations.

The following material is extracted directly from the task group's report of recommendations:

"Cost Assignment to End User Units of an Organization

"The task group states that implementing a cost assignment procedure aids management in several ways. First, when the user knows the cost of his service, he is in a position to perform a cost/benefit analysis and can determine whether the value received from a service is worth its cost. As a result, users become more cost conscious and sometimes reduce their demand for service. Second, the ADP manager is aware of the cost of operations of each user, and is in a position to concentrate on those high cost and demand areas warranting attention. And finally, top management can benefit from the cost information in fulfilling its responsibility for making sound ADP investment decisions. * * *

"* * * The report refers to organizational unit(s) receiving the products and services from the ADP activities as the 'end user units.' Because of the large number of 'users' who receive reports and other types of ADP products and services, we believe cost control can be enhanced by the designation of an official within an end user unit as a focal point of responsibility for the cost of ADP products and services. This person is referred to as an 'end user.'"

"* * * In their report, it is noted that a senior management official may be designated as having agency-wide responsibility for reviewing and evaluating the cost-effectiveness of all ADP products and services."

The Investigative Staff found that approximately $11 million of the $47.5 million devoted to computer services were applied to end users, but they were not charged for the services. It is the view of the Investigative Staff, based on discussions with the GAO and others, that the practices of treating ADP as a "free good" encourages proliferation and inefficiency. The Investigative Staff estimates that approximately $1.1 million or 10 percent of the $11 million nonaccountable ADP funds could be saved if end users had to pay for such services directly.

2. Department of Agriculture

The USDA FY 1977 budget totaled in excess of $11.8 billion. For the same period the total ADP budget was $99.3 million or .8 percent of the total budget. It appeared to the Investigative Staff that USDA was able to provide vastly superior service at lower relative costs as compared to DOI.

The USDA automated data processing funds are divided between the Office of Automated Data Systems (the centralized computer service) (24 percent) and the agencies (76 percent).

The Office of Automated Data Systems is comprised of a headquarters staff and five computer centers. These centers and their FY 1977 expenditures are as follows:

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Despite the hiring freezes, adverse personnel actions, and other problems, the office points to some accomplishments since its organization. They have conceived the concept of a Departmental Executive ADP Review Board, a Department ADP Strategy Study was completed, and a departmental ADP manual was published. Unfortunately, concepts and plans were not carried to fruition.

By means of procurement review, the office feels it has achieved reductions on GSA schedule prices on five procurements involving seven systems of approximately $24 million. This was 45 percent less than the GSA schedule price.

The Investigative Staff notes that it is unlikely that anyone would pay the GSA schedule price except in the case of a sole source. There were savings of over $2 million in a consolidated procurement of computer terminals which is significantly more than the saving that would have been effected on individual procurements by the bureaus and offices involved. This is a solid savings.

Shortly after the Investigative Staff began its review, the DOI Acting Assistant Secretary for Administration instituted an ADP sharing plan. As a first step in this process, the department is soliciting information from the bureau directors and ADP managers to:

-- Identify available ADP equipment capacity throughout the department which can be shared among bureaus.

-- Identify known ADP support requirements through FY 1979.

-- Compare available capacity with known requirements and arrange for ADP sharing arrangements where possible.

The second phase of the departmental plan calls for "* * * effective sharing of resources, development of common systems, consolidation of data bases, etc."

In a document prepared as part of the internal FY 1979 budget process for the Acting Assistant Secretary of Interior, the Director of the Office of ADP concludes that at present:

> "* * * the responsibilities of the Secretary are not being adequately carried out; the investment in ADP management has diminished in the face of greatly expanded ADP costs (20-25 percent per year); * * * there is minimal evaluation and measurement of the efficiency and effectiveness of the over $50 million annual ADP cost, well

> over $1 million of effort has been wasted due to poor management practices; the Department is subject to extensive criticism for inadequate management action; and increased Congressional and Executive management surveillance and controls are creating additional demands on ADP management."

The Investigative Staff agrees with this assessment and believes that the department must assume a positive role in the direction, management, and control of ADP resources.

C. Bureau of Indian Affairs (BIA)

1. Organization

The BIA consists of headquarters in Washington, D.C.; a central office in Albuquerque, New Mexico; 12 area offices; and 82 subordinate field installations (agency offices).

The person responsible for managing BIA is the Assistant Secretary for Indian Affairs. The incumbent in that office, with 24 employees, establishes policies, directs total operations, and represents BIA in dealings with Congress, DOI, other Federal agencies, the Indian people, and the public. These 24 employees--2 deputy assistant secretaries, 5 program directors, 5 functional directors, and 12 area directors--must be managed by the Assistant Secretary to assure effective communication and implementation of the Bureau's objectives and goals.

Office of Administration

The Office of Administration is responsible for providing staff support in the development and management of programs. These programs include the functions of audit, automatic data processing, budget, facilities engineering, energy conservation, finance and accounting, management research and evaluation, personnel management, procurement, property management, contracting and grants, program development and implementation, ADP planning and policy, tribal and administrative accounting services, administrative services, and safety management.

The office provides for ADP services to all offices and divisions throughout the bureau, either on a contractual basis or on its own in-house computer. It also has the responsibility under P.L. 93-638--Indian Self-Determination and Education Assistance Act--to assist the tribes in securing ADP support either by acquisition of computer hardware or software or both. This may be done by lease/purchase or by contracting with a service bureau.

This organizational structure within the Office of Administration has caused a problem in establishing priorities for computer use. As usually happens, the financial personnel insist that satisfaction of their ADP requirements is top priority while all other applications, especially functional, rank second. This attitude has caused personality clashes between financial and functional personnel.

The Investigative Staff recommends that BIA structure the ADP division to the level of an office, reporting to the Office of the Assistant Secretary. This type of action would allow the incumbent of that office to establish priorities in a fair and equitable manner, since the incumbent would have neither financial nor functional responsibility, but rather support responsibility to the offices and divisions within the bureau. The services rendered to the offices and divisions within the bureau should be on a fee-paid basis. Those who want computer support during the normal working hours would be charged accordingly for this service; while others who desire service during the nonworking hours will be charged less.

The Office of Indian Services

The Office of Indian Services is responsible for providing staff support to the Assistant Secretary in the development and management of bureau programs designed to promote the welfare and development of individual Indians and Indian communities, to assist tribes in developing local governmental services for Indian communities, and to assist tribes in developing their capabilities for self-government. These programs include social services, housing, law enforcement, tribal government, and tribal planning.

The Office of Indian Education Programs

The Office of Indian Education Programs is responsible for providing staff support to the Assistant Secretary for Indian Affairs in the development and management of Bureau programs which will provide educational opportunities to Indian youth and adults in either bureau, public, or private schools. The office provides technical and supportive assistance to field offices responsible for educational programs.

The Office of Trust Responsibility

The Office of Trust Responsibility provides staff support to the Assistant Secretary for Indian Affairs in the development and management of programs relative to the bureau's trust and legal responsibilities. This includes (a) the protection of Indians' rights in their trust property and those rights affecting trust property that are afforded by tribal sovereignty; (b) the exercise of the authorities vested in the Secretary of

Interior by various laws concerning Indian trust property and for providing to Indians the services necessary for them to make decisions required of them in the application of these various laws; and (c) administration of those programs which are provided to facilitate the trust.

The functions regarding the protection of the rights as cited in "a" above are performed in the Office of the Director. This encompasses (a) all matters involving rights which include water rights, land titles, boundary disputes, trespassing, hunting and fishing rights, contractual rights, the rights afforded by tribal sovereignty which include tax immunity or exemption, and the right to regulate fishing and hunting, zoning, and other land use; (b) liaison between field offices and the department on specific cases to bring about an administrative or judicial solution; and (c) provision of technical expertise in preparation of legislation including related reports.

The Office of Tribal Resources Development

The Office of Tribal Resources Development is responsible for providing staff support to the Assistant Secretary for Indian Affairs in the development and management of bureau programs to provide technical and financial assistance to enhance the economic development of Indian Reservations and their people. The office includes programs designed to assist Indian Tribal organizations and individuals in (a) business enterprise development, with strong emphasis on Indian ownership and entrepreneurship; (b) securing credit and financing from conventional and governmental sources to finance all sorts of Indian economic self-development, including loans for resources and building development, housing, public utility facilities, education, and other purposes; (c) qualifying for finding and occupying jobs both on and off reservation, consistent with the needs, capabilities, and applications of Indians; and (d) providing management and technical services associated with roads construction and maintenance programs.

Area Offices

Each area office is under the direction of an area director who is responsible to the Assistant Secretary for Indian Affairs for all activities of the bureau within the area. The area director is a line officer. He is typically assisted by a deputy area director or by one or more assistant area directors who are relegated line authority. The typical area offices include staff specialists in several or all of the bureau programs to assist in the discharge of the following area responsibilities:

(a) Represent the bureau in its dealings with the Indians, the public, State governments, and other Federal agencies with respect to the area's jurisdiction;

(b) Direct and assist in the application and implementation of overall policies and programs by operating offices, provide the necessary technical advice and review, evaluate performance and coordinate those features of programs which are wider in scope of application than the jurisdiction of a single operating office;

(c) Recommend to the central office revisions of policies, programs, procedures, and regulations; and

(d) Perform functions of an administrative and housekeeping nature which can be done most efficiently and economically on an areawide basis. The areas headquartered at Anadarko, Oklahoma; Minneapolis, Minnesota; and Sacramento, California; receive administrative support from the Muskogee, Oklahoma; Aberdeen, South Dakota; and Phoenix, Arizona area offices respectively. The Eastern Area receives administrative and program support from the Washington D.C. Office.

Reasons for Locating Computer Center at Albuquerque, New Mexico

As previously discussed, the BIA consists of offices in Washington, D.C.; central office in Albuquerque, New Mexico; and area offices including support agencies. Of the 12 area offices, 11 of these are west of the Mississippi River and one is located in Washington, D.C. It is because of this geographical dispersement of the area offices, their related agencies, and the Indian reservations, west of the Mississippi that Albuquerque was chosen as a central office.

Located within the central office are all of the divisions that support the Headquarter's Office in Washington, D.C. Of specific interest to this report is the Division of ADP Services in Albuquerque. The Investigative Staff asked a BIA official why the ADP services in Albuquerque could not be relocated to Washington, D.C. His answer was that such a move would be extremely disruptive, and the whole aspect would be highly political. Nonetheless, the Investigative Staff learned that communications and control by many of the Headquarter's staff over the Central staff is poor. Often decisions that should be made at Headquarters, Washington, D.C., are made by persons in the Albuquerque Central Office.

The Investigative Staff believes that this distance is detrimental to good management. Communications and controls, as defined by noted authors in the field of management, cannot be properly implemented over a span of approximately 2,000 miles. However, modern communications and computer technology helps to bridge such a gap.

Need to Define BIA Organizational ADP Requirements

Each organizational entity in BIA and respective support activities need various types of reports to effectively function. BIA has attempted since 1966 to satisfy its reporting requirements through the use of computer technology. However, the attempts made over the past 12 years have resulted only in fragmented reporting systems, which are now run on obsolete hardware.

The BIA, in its attempt to resolve this problem, has contracted with GSA Region 7 to do a Bureau-Wide ADP Requirements Study (BARS). This study completed in October of 1977, identified 19 major computer applications which, when developed, implemented, and integrated, will give BIA a good reporting system. BIA has informed the Investigative Staff that these 19 applications constitute the major part of its 5-year ADP plan. Specifically, the plan calls for the development and implementation of four applications each year.

The Investigative Staff, in the course of its interviews with bureau personnel to discuss their reporting needs, developed the following listing which depicts the various computer systems and subsystems that are needed by each office within the BIA. Although the listing does not show how one system integrates with another, the assumption is made that integration is necessary and will be accomplished. For example the Tribal Enrollment System of the Office of Indian Services should interface with the Land Records System of the Office of Trust Responsibility.

The systems identified below are more inclusive than those identified in BARS. However, there is a close correlation between the two.

Office of Indian Services:

- Tribal Enrollment
  - Geneology
  - Cultural
  - Tribal
  - Judgment Awards
  - Per Capita Payments
  - Community Services
- Law Enforcement
- Judicial

Office of Indian Education:

- -- Student Enrollment System
- -- Comprehensive information on academic aptitude and achievement levels
- -- Program-oriented financial management reports
- -- Curriculum or program information
- -- Staffing Requirements
- -- Class Scheduling
- -- Computer Assisted Instructions
- -- School Equipment Purchases

Office of Trust Responsibility:

- -- Land Records
  - -- Land ID
    - -- Surface
    - -- Subsurface
    - -- Life Dowry
- -- Natural Resources
  - -- Inventory of Resources
    - -- Timber
    - -- Wildlife
    - -- Soil
  - -- Resource Uses
    - -- Permits
    - -- Leases
    - -- Sales
  - -- Resource Management
- -- Historical Data
- -- Reservation Information
- -- People
  - -- Owners
  - -- Dependents
  - -- Members
  - -- Students
- -- Services

Office of Tribal Resources:

- -- Individual Indian Money
  - -- Deposits
  - -- Withdrawals
  - -- Interest
- -- Investments
  - -- Securities
  - -- Treasury Notes
  - -- Interest

- -- Grants/Contracts (PL 93-638)
  - -- Education
  - -- Vocational Training
  - -- Small Business
  - -- Individual
  - -- Law and Order

Office of Administration:

- -- Payroll/Personnel
- -- Accounting
- -- Property Management
- -- Procurement

2. Inefficient and Obsolete Hardware at the Albuquerque Computer Center

Hardware problems have plagued the BIA from the time of its first computer acquisition in 1966 to the present day. BIA's first computer acquisition was a second-generation scientific computer--a CDC 3100. The history that follows shows that BIA is still within the CDC 3100 series of computers despite the efforts it has made to upgrade to more sophisticated equipment.

As with most machines of this vintage, there are numerous problems:

- -- The operating system (the software that runs the computer, its peripherals, and the programs) is no longer reliable.
- -- The hardwire circuitry is unreliable.
- -- The hardware is not designed to interface with telecommunications devices.
- -- There is very limited backup, if the computer should breakdown.
- -- It prevents the users from complying with programming higher-level language standards as is possible in COBOL and FORTRAN.
- -- Its obsolescence prevents it from utilizing the latest programming techniques such as a data base management system.
- -- Obsolescence also penalizes data processing personnel by minimizing their experience in the state-of-the-art.

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The Albuquerque Computer Center purchased its first major computer in February 1966 from Control Data Corporation (CDC). This was a CDC 3100 computer. The main purpose of this acquisition was to centralize processing of land record information, payroll, personnel and accounting applications. (More will be said concerning these applications under the headings on automated administrative applications and functional applications.) The CDC 3100 computer was manufactured by CDC in the late 1950's and the early 1960's and was primarily to serve the scientific community. Consequently, the machine design and its supporting software was directed toward that end. However, this machine can be used for administrative applications.

Within a 2-year period the CDC 3100 was saturated with applications. Consequently, a second computer--a CDC 3150--was purchased in January 1968. In March 1973, the BIA replaced the CDC 3100 with a leased CDC 3170 under an interim delegation of procurement authority (DPA). However, the components (disc and tape drives, card readers, etc.) were purchased for the CDC 3170 central processing unit (CPU). It was brought to the attention of the Investigative Staff that the decision to replace the CDC 3100 and to lease the CDC 3170 was made by BIA Headquarter's management without any consultation with the Computer Center management. This observation highlights the breakdown of communications between the Washington, D.C. office and the Albuquerque office.

In September 1974, GSA extended the interim DPA for the CDC 3170. In October 1975, BIA established what is currently known as their ADP Modernization Plan. At this point, BIA failed to place their emphasis on the need for new modern hardware. Rather they emphasized their need for new program capability. In December 1975, BIA briefed the GSA on its ADP Modernization Plan and received from GSA another extension on their interim DPA for the CDC 3170, contingent on a third-party buy, that is the leasing of hardware from a computer leasing company.

BIA advertised its ADP Modernization Plan in January 1976 in the "Commerce Business Daily" resulting in responses from the large computer manufacturers on their computer equipment capabilities. The next several months were spent in talking to vendors. In June 1976, BIA talked with representatives of OMB, GSA, and DOI on its immediate need for computer upgrade alternatives and approaches. An interim solution proposed by GSA was the acquisition of a CDC 3500, which was 12 years old at that time.

The rationale for this proposed acquisition was based on the fact that there would be no major alterations to existing operations, storage technology, file access methods, or applications software systems. Although the proposed hardware is the "end of the line" for this particular family of computers and no future expansion is possible, it would have given BIA time to

develop a fully competitive RFP for procurement of modern computer technology.

In July 1976, the Office of ADP and Telecommunications Management in DOI reviewed and approved BIA's specifications and requirements and requested GSA approval for a DPA. The Chief, Equipment Control Branch, ADP Procurement Division, Automated Data and Telecommunications Service denied the request in a letter dated August 13, 1976, on the basis that BIA did not comply with GSA's directive of December 29, 1972, " * * * to issue a solicitation document to replace the system on a fully competitive basis within six (6) months * * *." The letter further states the chronology of events from December 1972 to August of 1976 and depicts BIA's procrastination to solicit proposals on a fully competitive basis. GSA concludes that this procrastination " * * * indicates a lack of management emphasis in order to comply with existing procurement policies, your current APR [Agency Procurement Request] to procure a CDC 3500 system for an additional two year interim is hereby denied * * *."

In an interview with the former GSA official who made the above statement, the Investigative Staff was informed that the above decision was based on poor management in BIA and not on the principles of the Brooks' bill. This GSA official also stated that BIA's justification for the interim DPA for the CDC 3500 was based on future requirements and not on the fulfillment of current needs.

Because of this denial, BIA developed a request for proposal (RFP) in November 1976 to replace the system. The Investigative Staff determined that the BIA nominally followed the department's rules and procedures and the GSA procurement regulations for the new equipment acquisition. The funds for the acquisition had been approved in the FY 1977 budget. However, in accordance with House Report 95-392, the Chairman, Subcommittee on Interior and Related Agencies, stated in his letter of August 4, 1977, that it would appear prudent to delay any further computer acquisition in the department until the investigations were completed and hearings were held. This was confirmed on September 12, 1977, by a second letter from the Chairman in response to a request for reconsideration of the above.

In the meantime, BIA continues to operate its computer facilities with a CDC 3150, acquired in January 1968 and a CDC 3170 leased in 1973. Both of these machines are classified as second-generation computers, which operate in a serial-batch mode, that is, only one job at a time can be performed. To increase the efficiency of these machines, BIA altered the operating system (the software that runs the hardware and its components). This alteration limited the backup of this hardware to already too few computers of the same configuration. The only backup for this system is in Grand Junction, Colorado, provided that the operating system is realtered.

It's true that Control Data Corporation will continue to maintain the CDC 3150 and the CDC 3170. Further, CDC can replace the operating system. However, this does not keep the system from going down nor does it guarantee the validity of the processing capability of the machines. As one official in BIA told the Investigative Staff:

> "A flick of a light switch can cause an interrupt in the processing, which results in bad data."

Another official pointed out that a production run can go for several hours and there is no way of knowing if the output is valid until the run is completed. Experience has shown that because of this unreliability, production runs had to be resubmitted for processing.

The above hardware is saturated. During the year 1976, 68 percent of the computer time was used for administrative applications (payroll, personnel, procurement, and accounting); and 32 percent for functional (mission-oriented) applications. The inadequacies and inefficiencies of the current hardware are universally recognized by DOI, GSA, OMB, and other Federal agencies. BIA has a definite need for modern computer technology to satisfy its management needs for timely and accurate reports.

The Investigative Staff in its analysis of the chronology of events has identified several problems; the acquisition of CDC 3150 and the CDC 3170, the denial by GSA of the sole-source procurement of the CDC 3500, and the inability of the Office of ADP and Telecommunication Management within DOI to sustain its position with GSA for the needed procurement.

The CDC 3150 and CDC 3170 are scientific computers, but are being used by BIA for administrative applications. Thus, the systems software and the programming languages are unique to this hardware. As a result of this, program applications (payroll, personnel, land records, etc.) are not readily transferable to other hardware configurations. Further, the program languages, specifically COBOL, do not meet the standards of the American National Standards Institute (ANSI) Committee. Notedly, the first COBOL standards were established by the Committee in 1968 but were not applicable to CDC's COBOL. In terms of present-day dollars, the cost to convert the BIA program applications to ANSI would be approximately $300,000.

Conclusion and Recommendations

The BIA's administrative and mission-oriented function cannot be satisfied by its current CDC 3100 computer series. The

purpose for which this computer series was manufactured has long since served its objectives and goals. Basically, these objectives and goals have now changed so that computer series are manufactured to handle large volumes of data through batch, remote batch, and immediate access.

BIA must come into this environment of computer technology to more effectively fulfill its mission of delivering services to the Indian people. Recommendations as to how this may be accomplished are considered under the heading "Alternatives to Be Considered for Computer Effectiveness."

3. Inefficient ADP Programs Result in Untimely and Inaccurate Management Information

The lack of an ADP development plan for the use of the CDC 3100 computer series has caused BIA a continuous problem. The original intent for the computer series in 1966 was to satisfy the informational needs of Land Record management. However, this intent was usurped by the financial people who needed payroll, personnel, accounting, and inventory to be programmed for the series. Consequently, the applications being run currently at the Albuquerque Computer Center are divided into 68 percent financial and 32 percent functional.

The Investigative Staff, in its field interviews, found that the majority of the users--both financial and functional--were dissatisfied with the outputs that they were receiving from the system.

Automated Financial Applications

The payroll, personnel, and accounting system is an integrated system that passes personnel information into the payroll programs, which in turn updates the job cost records in the accounting system. The system generates reports to satisfy requirements of the Civil Service Commission, DOI, the Department of Labor, etc. However, the payroll/personnel reporting requirements of the area offices are not being met. The area offices have expressed their concerns about unmet needs to BIA top management for the past several years. However, the end result is no action.

The payroll, personnel, and accounting system comprises 292 programs which are not in the same programming language. Some are written in CDC COBOL; other in COMPASS (basic assembly language). This too adds to the complexity of the system, specifically, from a maintenance point of view. A change to any one program may necessitate changes to one or all of the 292 programs in the system. In simplistic terms, it is an inefficient "patchwork" and not worthy of conversion for further use on a more modern computer.

Couple this problem with the current hardware (CDC 3150 and CDC 3170) problems and it is a wonder that BIA can process their payroll on time. The Investigative Staff was informed that BIA is off schedule three quarters of the time in processing payroll. The result is that there is a high overtime cost in order to make the deadline for the delivery of the payroll check tape to Denver.

If there is an equipment failure at Albuquerque, the chances of getting the payroll processed on a back-up computer are slim because the operating system has been altered by BIA and there is difficulty in obtaining 24 hours of continuous and exclusive time on the back-up computer at Grand Junction. The only other alternative left to BIA would be to use the check-tape of the previous pay period in paying their approximately 13,000 full-time and 5,000 part-time employees. Updates to payroll records by computer or manually would have to be made when the hardware problems would have been corrected.

Another serious problem is the acquiring and training of qualified personnel to replace the positions vacated as a result of the Indian Preference Act. Because of these vacancies, the Payroll Office has to resort to outside contracting in order to meet their programming requirements. Normally one would expect such basic programming requirements to be satisfied by the ADP group.

BIA has made efforts to transfer their payroll system to other Bureaus. However, because of the volume and complexity in the payroll system, there were no offers.

If BIA had been able to convert or transfer the payroll system to another computer site, BIA would still have the problem of supporting the other programs in the system. The Bureau of Reclamation is designing a payroll system to include BIA requirements utilizing a former BIA employee. As an aside, the Bureau of Reclamation plans to have the DOI Payroll System operational by the fall of 1978.

Officials within BIA believe that the maintenance and support of the payroll system can be minimized by having it under a Data Base Management System. In this way, a correction to any data element in one program will be automatically corrected for all programs that use that data element. Of course this solution means that the programs are all converted to ANSI COBOL 74 (a more extensive dissertation is given on Data Base Management Systems in Section VI A).

The BIA accounting system drew the most criticism from BIA users. Most users unanimously stated that the reports are not timely, nor accurate. If they did not keep their own "cuff" accounts, they would not know what funds have been obligated or deobligated.

The Investigative Staff was advised that BIA's accounting system is more complex than any other agencies' systems. This results from BIA compliance with many different types of funds and laws. Many of these are unique to the needs of the tribes, the BIA, land records, schools, loans, irrigation systems, mineral rights, etc. In addition to these, regulatory changes come along that further cripple the operation. The Investigative Staff reviewed the system and concurs on its complexity. There are approximately 750,000 data records now in the system and the volume continues to increase. Eventually, the rate of increase will exceed the capacity of the system to update these records.

The monthly reports generated by the system are equivalent to 140 boxes of paper, or an equivalent of 268,800 pages. Each page is 11 by 14 inches. About 25 percent, or 35 of these boxes were retained in-house and the remaining 75 percent were sent to Headquarters, areas, and agency offices. The information needed from these reports by personnel in the respective offices was there. However, personnel had to dig for it. Unfortunately, the system does not produce summary reports which would be useful to meet the informational needs of the various management levels.

To eliminate the problem of sending out so many boxes of paper, the BIA has contracted to have them microfilmed. The contract cost for microfilming for 1977 was approximately $12,000. Nonetheless, this neither eliminates the problem of summary reports for each level of management, nor does it eliminate the production of 140 boxes of paper.

The inadequacies of the system are due not only to the limitations of the equipment but also to the inability of ADP management and financial management to communicate effectively with one another. ADP management feels that it should be meeting the functional needs of the bureau and that it should not be sacrificing the functional information needs for administrative informational needs. At present, the administrative needs take up 68 percent of computer time.

The Investigative Staff noted that financial management has its own software development support because the ADP staff is so under manned that it was not capable of giving support. This only adds to the friction between the two divisions as to why things are not being done properly.

As in the payroll, personnel, and accounting systems the accounting system is a "patch work quilt" written in antiquated versions of programming languages. Consequently, maintenance and support for this system are a problem. To update the programs in the system to acceptable COBOL standards, the programs would have to be converted. This conversion cost would be part of the $300,000 mentioned earlier.

The Investigative Staff feels that this money could be better spent to develop a new design for the system. The Investigative Staff strongly recommends that the BIA concentrate its effort on the design of report formats that would satisfy the informational needs of each level of management throughout the bureau.

BIA's property/inventory system is exceeding the capacity of the current equipment. On a daily basis there are 1,500 line items entered into the ordering system. The Investigative Staff was told by the Property and Procurement people that they expect the line items to double by next year because telecommunication devices will permit entry of new items into the system. For example, the Juneau Area Office entered a tremendous number of textbooks creating thousands of new line items. Other items are related to plant management, fuel oil, carpeting, pencils, etc. Basic users of the system are the plant management and education personnel, who feel that the system does not satisfy the needs for school inventory.

BIA has a coordination problem with GSA's Federal Standard Requisition and Issuing Procedures (FEDSTRIP). Orders placed with GSA through FEDSTRIP are sometimes cancelled, but BIA is not aware of the cancellation for several days. This delay can be critical when the item or items are badly needed, as they would be in the case of loading BIA's ship, called the NORTH STAR. This ship carries supplies to Alaskan installations. Because of weather conditions, it cannot call at every port of call on each run. The NORTH STAR makes two runs per year; during this time it is scheduled to arrive at all ports. Therefore, if supplies are missing for a port of call, it may be a year before that port can get its supplies.

The acquisition of modern telecommunication and computer technology whether owned, leased or shared could go a long way to alleviate some of these problems. A further resolution would be to allow BIA to access GSA's data base to determine the status of a line item in FEDSTRIP.

Additional information was conveyed to the Investigative Staff regarding the report Form 1166, used on real property and determination of square footage. The ADP programs are not written to sort out and retrieve information for user needs. Reports are apparently meeting the informational needs of upper management, but not of field personnel. As a result, needed information, which is not always too readily available, has to be retrieved manually. This is particularly true with regard to inventory. BIA is experiencing serious problems with loss of material, such as heavy building equipment, caterpillar tractors, washers, dryers, TV's, etc. They are also experiencing problems with the cannibalizing of plumbing and fixtures from school buildings.

In the opinion of the Investigative Staff most of these problems could be resolved with a good property/inventory control and procurement system. To support this system, BIA has need for modern communication techniques and computer technology. A redesign of the current system and its subsequent conversion to modern technology would not be as advantageous as a complete new design of the entire system. Again, the emphasis in the design should be to satisfy the information requirements of users at all levels.

Automated Functional Applications

The Tribal Enrollment System, now known as the "People System," is one of BIA's most important systems. The purpose of this system is to identify the number of Indians on reservations and the number of Indians on tribal rolls, also to give detailed information on individuals, such as names, addresses, blood quantum, etc.

The Tribal Enrollment System that is operational in Albuquerque comprises the per capita/membership system which is used for the preparation and maintenance of membership rolls, and when needed for the distribution of funds to tribal members. The other system, called the Judgment System, is used for the preparation of rolls by the Secretary of Interior for the distribution of judgment funds on a descendancy basis. These current systems are not standardized and require changes in the programs each time a new roll is added. Updating these fast growing systems is very difficult, since documentation is very inadequate. The system in itself is inadequate since there is no way to identify duplication in the 759,562 records that are currently in the data base. In addition, information needed from the current system is very slow in reaching the end users. The importance of the system is in its interface with the Land Records Information System, the Natural Resources Information System, and the Individual Indian Money System. Because none of these systems are tied together, there is a vast amount of manual operations involved. Progress has been slow in BIA to integrate these systems. The reason given is higher priority to the development of other applications. Other reasons are:

a. Lack of training on the part of those who supply the information.

b. Lack of experienced programmers and analysts.

The following exhibit depicts by area the number of per capita/membership, the descendancy rolls, other rolls, and enrolled people that are currently on, and expected to go on the system.

TYPES OF ROLLS

Area	Per Capita/ Membership		Descendancy		Other		Enrolled People	
	On	To Go	On	To Go	On	To Go	On	To Go
Aberdeen	13	5	3	0	1	0	114,005	8,000
Albuquerque	1	6	0	0	8	0	6,778	7,000
Anadarko	15	4	2	0	0	0	53,403	7,500
Billings	1	8	0	0	0	0	7,147	38,000
Eastern	2	8	0	0	0	0	6,358	17,000
Juneau *	1	2	0	1	0	0	120,000	18,500
Navajo	0	0	0	0	0	0	140,254	--
Minneapolis	14	7	1	4	0	0	59,938	20,000
Muskogee	2	2	5	2	1	0	66,384	228,500
Phoenix	11	9	1	2	0	0	56,519	30,000
Portland	12	4	1	9	1	0	35,507	17,793
Sacramento	1	18	1	1	1	0	75,515	20,000
Navajo-Hopi	0	0	0	0	1	0	17,754	--
	73 1/	73 2/	14 1/	19 2/	13 1/	0	759,562	412,293

1/ Total Number on Rolls -------- 100
2/ Total Number to Go on Rolls -- 92

Completed Rolls ---------- 192

Total enrolled now on system ---------- 759,562
Total enrolled estimated to go on system ---------- 412,293

Combined total of estimated people to be on system when completed ---------- 1,171,855

* Alaska Native Enrollment System currently being processed by Computer Science Corporation.

The biggest flaw in the whole system is the inability of the system to uniquely identify each individual Indian. This is compounded by the fact that the individual Indian in the Land Records Information System, the Natural Resources Information System, and the Individual Indian Money System has a different identifier in each system. Threading through these systems and other systems, such as education, welfare, etc., can be a difficult problem. The Indians do not want it solved, as they do not want to be tracked from cradle to grave. With sophisticated computer programs, a crosswalk in the form of a data dictionary makes this relatively simple.

The Investigative Staff concurs with BIA's recommendation that there is an urgent need for training tribal leaders and their membership in the development of tribal rolls. The Investigative Staff recommends additional training, such as that which took place recently, of personnel responsible for data preparation and data entry into the system. Further, the Investigative Staff recommends that BIA acquire and train qualified personnel to maintain and support this system, especially when the new system is going to be developed.

The Investment Program is used for making investments of moneys held in trust for individual Indians and Indian tribes to realize a maximum of earnings for each account. Presently, the Bureau invests about $700 million for approximately 215 tribes, 170,000 individual Indians, and 114 agency offices and schools. The bureau invests in Certificates of Deposit at major banks, savings and loan associations, credit unions, Government securities, and other Government supported investment programs. Each investment is made for 60 to 90 days with a distribution of earnings made every 6 months to each respective individual and/or organization. There are basically two categories of investments:

a. Pool Investments--These are investments made from a pool of moneys held in bureauwide accounts with earnings distributed to appropriate accounts.

b. Tribal Investments--These are investments of tribal moneys which are made at each tribe's request. An important note is that many of these tribes rely on these investment earnings to subsidize the economic requirements of their tribal governments. If earnings are not realized or are insufficient to their needs, the tribes are forced to draw from their principal to satisfy their requirements.

The total earnings from investments of approximately $700 million in FY 1976 were $39 million. The previous year the yield from $520 million was $47.1 million.

The ADP role in the investment program is significant in that the program is heavily reliant on computerized information of available moneys for investment. Presently, the investment program is furnished summary information extracted from another major system. This information is supplied daily, primarily in summary form necessitating an extensive and time-consuming manual manipulation of data prior to each investment. In considering the large gross dollar totals, time is a major consideration. It is fairly conclusive that, one hour, one day, or one week is significant in loss of potential earnings based on these dollar figures. A case in point; weekly gross investments range from $10 to $40 million. When investments are curtailed, usually due to time loss for manual operations, computer "downtime," or other related delays, potential losses are estimated to range from $1,700 to $7,000 per day, per investment.

The importance of the investment program speaks for itself. Yet the only ADP support that it has is a file of investments, where the funds are invested, and the maturity dates of each investment. In addition to this, the investment branch has an on-line terminal to Rapidata, which gives information on interest rates throughout the financial community.

The Investigative Staff recommends that this program be given the attention of current ADP modern technology. In this way it is conceivable that investments could be maintained and controlled to realize their full potential in earnings.

The Educational Systems. The only automated system within the Bureau of Indian Affairs is the Student Enrollment System. This system is an offshoot of the defunct Student Record Transfer System (SRTS) which was developed during the late 1960's and early 1970's. The purpose of the SRTS was to provide an electronic transcript for every student attending BIA schools. Beginning work on SRTS was accomplished under an Elementary-Secondary Education Act (ESEA) Title III grant. In December of 1971, GSA developed a general plan for SRTS and by the end of 1972 the specifications for the system were completed. In January 1973 the SRTS was presented to the assistant area directors for Education for their approval. The system was rejected on the basis that the information to be found in the system was a violation of the Indian's privacy.

The Investigative Staff requested copies of the purchase order from GSA for services performed on the SRTS. GSA could not locate copies of the purchase orders. In lieu of these copies, they supplied the Investigative Staff with the following information:

Year	Month	Amount
1972	April	$ 4,733.99
1973	June	42,334.46
1974	May	3,319.78
Total		$50,388.23

The Investigative Staff assumes, from the moneys spent in May 1974, that little was done to alter the SRTS to satisfy the informational requirements of the Assistant Area Directors. Further documentation acquired from GSA shows that in August 1974 there was a balance of $107,992 in the SRTS account, which was transferred to the Student Enrollment System (SES).

The Office of Education requested BIA ADP to develop the SES for them. BIA ADP refused because they lacked the resources. With the approval of BIA ADP, the Office of Education contracted with GSA in August 1974 for the development, design, and implementation of this system. (The $107,992 plus $15,962 was used to pay for this service.)

In February 1975, the Design Plan for the Student Enrollment System was completed and accepted by the Director, Indian Education Programs. Six months later the system was operational. However, before going operational, the system was never tested for bugs and no parallel test was made. Consequently, problems had to be resolved in the operational stage. This course of action only served to create a lack of confidence in the system. Other problems arose, such as training of school personnel in the requirements of the system and the laxity of Educational ADP coordinators in the training of school clerks with regard to data entry. In other cases, problems have been created by a significant turnover in personnel.

The purpose of the Student Enrollment System is to identify those students who are enrolled in BIA schools. Therefore, the system is basically used to develop statistics, which are in turn used for determining funding levels for Title I projects. However, the statistics obtained are inaccurate. One BIA Official told the Investigative Staff, "Most of the information used is based on 'olue skying' and 'guessing' for the data that is used to fill out the various inquiry forms." The cause of this problem is apparently due to a lack of conscientiousness among some of the clerks involved with the program. They do not verify any changes in enrollment and if they do, they do not enter them into the system. The Office of Education recognizes this problem but can do nothing about it, since they do not have the funds for auditing or checking data accuracy.

Conclusion and Recommendations

The Investigative Staff recommends that all of the administrative applications of the BIA be consolidated with those of the other bureaus within DOI. The recommendation implies that these applications would undergo a new design. The emphasis BIA should place on the new design is the satisfaction of the users for needed information and the means by which the user is to receive this information. Again, it is important to stress that BIA will need qualified personnel to achieve this objective and travel funds to define user requirements. There must also be free and open communications between the users and the technical staff.

With respect to the departmentwide payroll system, BIA should work closely with the Bureau of Reclamation and assign a full-time staff member to the design and development of the system to insure the satisfaction of BIA's payroll requirements.

An alternative to doing the new design in-house is to contract for the entire design of administrative applications. Let the contractor determine the system specifications and the best means for entering data and retrieving data from the system. BIA should assign personnel to the project to assure continuity of the system after contractor completion.

Another alternative would be to allow BIA to continue with the status quo. However, the Investigative Staff would have to reject this alternative, since it would only compound existing problems.

Lastly, the Investigative Staff would like to reiterate a recommendation previously made. That is to remove the management of all data processing from the Office of Administration and create an Office of Data Processing, where scheduling and priorities are established without allegiance to any one particular office, division, or field office within BIA. The users would be required to pay for the services received on a monthly basis. This latter point would eliminate the arbitrary assessments that are now levied by the central office on the program managers; this has been a source of much consternation to them.

The prime mission of the BIA is to serve the Federally recognized tribes and its people. To do this, the BIA must be able to identify, through a Tribal Enrollment System, each individual Indian. The prime source of information for this system is from the tribes themselves. However, members of the tribes must first be trained in the development of tribal rolls. Therefore, the Investigative Staff recommends the training of personnel for data collection, preparation, and entry into a computerized system. Further the Investigative Staff recommends that BIA acquire and train qualified personnel to maintain and support

this system, especially since plans are being developed for the redesign of the Tribal Enrollment System--now known as the People System.

The BIA's Investment Program is a fragmented system. The information needed in order to make the program effective has to be gathered from several sources. One source is the CDC 3100 series, which is, as pointed out, unreliable. A breakdown in this source or any other source for needed information constitutes a tremendous loss in revenue to the tribes. Therefore, the Investigative Staff recommends that BIA give the Investment Program the immediate attention of current ADP modern technology together with experienced ADP people to keep the system efficient and effective. In this way it is conceivable that investments could be maintained and controlled to realize their full potential in earnings.

A major part of the BIA fiscal year budget is allocated to the education and training of Indian people. Yet, despite the resources given to the BIA Office of Education, this office does not have a viable integrated educational system. The Investigative Staff strongly recommends that this office have its own ADP budget and use it to implement the recommendation made in the January 1977 GAO report.

4. BIA's Land Records System Unacceptable to Users

The Land Records System is one of the most important systems within BIA because it must keep track of Indian lands and the natural resources on these lands that are held in trust by the U.S. Government. This is one of the prime reasons for the establishment of the BIA. Yet despite its importance, the BIA has not developed a viable system that can respond to the informational needs of the Congress, the tribes, Federal agencies, and State and local governments. It is not because the BIA has not attempted to come up with plans for a viable system; it is because of the many plans that have never been properly implemented.

Prior to 1958 the official records for Indian lands were maintained in Washington. These antiquated, inadequately indexed records, almost illegible in some instances, were located in Headquarter's office files, in the National Archives, in the Federal Records Center, in the Bureau of Land Management, and in the files of other agencies of the Government.

Scattered as they were, and despite their generally poor condition, these records were much more reliable and complete than those kept in agency offices. The agencies' land records consisted mainly of allotment and inherited interest cards to which were posted (although seldom currently) sales, probates,

and other title transactions of which the agency had knowledge, largely either because the transaction had been initiated by the agency or because of the partial copies of title documents furnished to it. The degree of accuracy and completeness of these records varied widely from agency to agency. Records for tribally-owned lands were, in many offices, virtually nonexistent. It is hard to believe that such conditions were permitted to persist.

Because of the inaccessibility of the official records in Washington for day-to-day use by agency realty personnel in the preparation of title status reports, it was the agency records, such as they might be, that were the primary sources relied upon in determining current land ownership for processing sale, fee patent, and leasing transactions. In turn, the ownership determinations served as the basis for the distribution of lease rentals, grazing fees, and other income from trust lands.

In the agency realty branches, a large percentage of the available man-hours was spent in posting to these records, tracing chains of title, and laboriously computing fractional interest, rather than in attending to the more substantive aspects of real estate management. The Investigative Staff on its visits to area and agency offices were told by realty management that this condition has not changed.

However, the desirability and necessity for a comprehensive revision of the basic land records of the Bureau as well as of its systems both for recording land transactions and for determining title status had been recognized prior to 1958, and recommendations to this effect had been made by, among others, the Binson Committee (Congressional) and the records specialists who had been consulted. It was not until April of 1958 that a formalized proposal was presented by BIA. By a memorandum dated May 22, 1958, DOI gave its approval and directed that the necessary studies be initiated from which a program could be formulated for submission to the Congress.

The results of the study showed that the only way that this massive volume of data could be managed was through the use of ADP. A plan was formulated for the capturing, processing, and retrieving of data. Final approval of the plan was obtained from DOI, the Bureau of the Budget, and the appropriate committees of the Congress. In July 1960, the plan was officially launched. DOI's appropriation for FY 1961 included the sum of $610,000 to initiate the program. Undoubtedly one of the motivating factors which led the Congress to approve special appropriations for the project was the astronomic proportion of the chaos created by the descent of Indian lands through inheritance and the need for new methods which would enable the Bureau to better cope with the problem, particularly in the matters of ownership determinations and distribution to those owners

of the income from their lands. (There are current problems on this same subject where Indian tribes are laying claims to land in the New England States.)

Briefly stated, the objectives of the Land Records Improvement program are these:

a. The decentralization from Washington of all the official land records and source title documents to title plants established at various field locations. Currently, there are five title plants located at: Aberdeen, South Dakota; Anadarko, Oklahoma; Portland, Oregon; Albuquerque, New Mexico; and Billings, Montana.

b. The establishment of these plants as the official offices of record for the respective areas they are to serve.

c. The installation in the plants of a modern records system. This includes:

(1) Through the use of ADP, the creation of new tract indexes for each reservation or land entity, wherein there is listed by section, township, and range, in chronological sequence, a reference to the record of every title element pertaining to each separate tract of land within said section or a legal subdivision thereof. These indexes include both surface and subsurface interests.

(2) Likewise through the use of ADP, the following reports are to be produced:

(a) A land description in tract number sequence.

(b) A listing of the current owners of each separately-owned tract, showing the fractional interest of each owner as acquired, and as reduced to the lowest common denominator.

(c) An inventory of the land interests in identification number sequence owned by each living Indian.

(3) The microfilming of all documents of conveyance.

(4) The preparation of base and ownership status maps.

d. Again, through the use of ADP, the current maintenance on a day-to-day basis of the new tract index and the subordinate tract, ownership, and inventory listings.

e. Current land ownership data stored on tapes to be available for use in automated programs for other bureau activities.

f. Upon completion of plant construction, the title plants plan to take over from agencies the preparation of all Title Status Reports on an "as needed" basis. These reports will be based on an examination by skilled title examiners of each source title document making up the chain of title to a particular tract of land. Further, the title plants will be taking over the task of preparing inventories of the land interest owned by descendents--these for the use of the probate examiners.

To implement the ADP objectives, the BIA contracted with the Service Bureau Corporation in Washington, D.C., an IBM subsidiary for systems development. Later arrangements were made to use IBM computer equipment located at the Naval Weapons Laboratory at Dahlgren, Virgina. This was an IBM 7090, an early second-generation scientific computer.

Early in 1963 BIA terminated the contract with the Service Bureau Corporation and transferred all of the ADP work to the Bonneville Power Administration. This commitment lasted until January 1966 when the entire system was transferred to the BIA's own computer center at Albuquerque. While these successive transfers compounded the problem, they were not the primary reason that BIA did not have a viable system.

In 1969 and early 1970, many further problems, particularly in the ownership systems, were being encountered with the processing of data on the Albuquerque computers. Outputs were now totally unreliable and thus unusable at the title plants. Resolution to the problem was the design of an entirely new system. In March 1970, all processing on the ownership system was halted pending its rewriting. As many of the programs on the index part of the system had already been converted into COBOL, it was possible to continue limited production operations. Upon completion of the rewrite, all files were updated, and the new Land Record System began in 1974 and is continuing to date.

Another problem is the timeliness of data which is entered into the system and returned to the user. Specifically, the needed reports arrive too late at the title plants to be of use to the realty people. This has resulted in a loss of money in cases where needed data was lacking for paying owners of leases and for court cases.

The users defined the causes of these problems as:

a. BIA current hardware equipment is inadequate.

b. Application priorities of the BIA computers are given to administrative functions.

c. BIA failed to develop a Land Records Data Base that would be accessible to all branches of Government. The Investigative Staff was told that a 5-year goal (1966-1971), was established in the original plan.

d. Title plants are understaffed.

e. There is a lack of documentation for the system.

f. Only inexperienced analysts support the system.

g. There are territorial and jurisdictional disputes within the BIA ranks.

The BIA realty people have no confidence in the BIA ADP staff to satisfy their requirements. The BIA ADP staff claims that the Land Records Information Program (LRIP) Liaison Office established a policy, agreed to by BIA top management, that BIA ADP Land Systems personnel were not to have any direct contact with the five title plants--the recipients of all reports produced. The Land Systems personnel admit to the inadequate design of the original system, which causes loss of lease money, land sales, etc.

The Natural Resources Information Systems (NRIS) may be considered a subsystem of the Land Records Information System. The purpose of this system is to maintain and process current information relative to utilization of all Indian Land resources throughout the BIA. A method to identify various resources on Indian Land is highly desirable for several reasons--impact on monetary benefits that individual Indians may realize, planning for wise and efficient utilization of these resources, volumes of resources as they may impact national defense/energy planning, etc.

The types of information that will be in the system are:

a. Identification of natural resources--surface/subsurface mineral deposits, oil/gas reserves, chemical soil types, timber resources, etc.

b. Identification of man-made improvements and utilization--irrigation, agriculture, forest management, land restoration, etc.

c. Location where both natural resources and man-made improvements exist.

d. Marketable values of both types of resources.

The only implementation of this plan known to the Investigative Staff is a pilot project being conducted by the Colville Indian Reservation in conjunction with Washington State University. The Investigative Staff did not have time to personally review this system, however, it did review the documentation from a user's point of view and found it to be adequate.

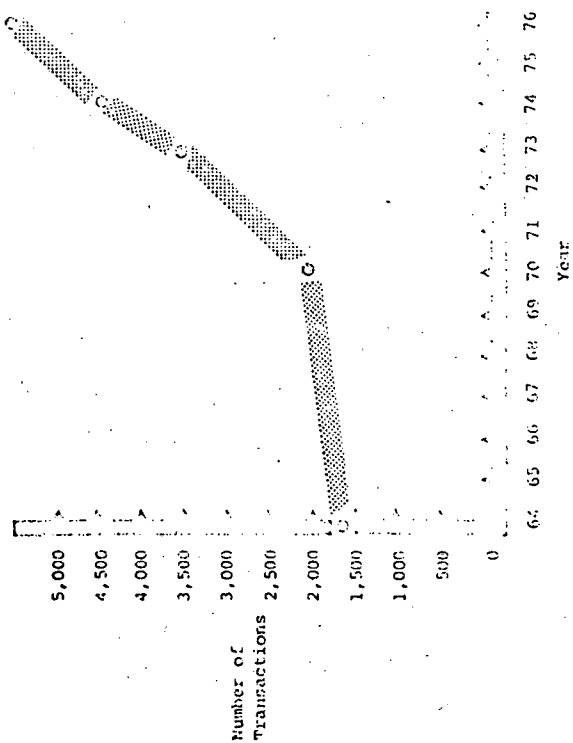
The Investigative Staff recommends that BIA make a complete study of the Colville Indian Reservation Natural Resource Information System and ascertain how it can be applied Bureau-wide. Further, this type of system is also being developed by other bureaus throughout DOI and by the Forest Service. Further discussion on the entire concept of land-use data can be found in Sections II D and II E.

5. Billings Area Office Developed an Effective Land Record System--A Hope for the Future

In the Billings Area Office, the Investigative Staff learned that the BIA ADP staff could not support informational needs for Land Records in the Billings area. In 1972, the Billings Area Office conducted a feasibility study for the design of its own Land Records system, which is called the Integrated Records Management System (IRMS). The BIA Central Office assisted the Billings Area Office in this study. The results of the study showed that BIA Central Office could not fully respond to the needs of the Billings Area Office. Therefore, it was concluded that the Billings Area Office should acquire a small, but sophisticated, computer in the area office, managed and operated by a four-person data processing staff. Under this system, Indian Reservations are linked to the main computer through intelligent terminals with on-line printers. Processing requests originate at the reservation terminals; work is done by the Billings computer, and output is transmitted to the reservation terminals and printed.

The Investigative Staff on its visits to the Billings Area Office was favorably impressed with the management of the area office and its systematic approach in supplying the needed information to the agencies and tribes under its jurisdiction. The purpose of the following pages is to show the complexity and volume of data that is collected and entered into the Land Records System. The following exhibit shows the increase in the number of land transactions over the past 10 years in the Billings area. These transactions result from changes in deeds, mortgages, right-of-way, probates, leases, etc. The point that is important here, is that the increase in transactions represented in the exhibit are also taking place within the other four title plants.

BAO TITLE PLANT CHANGE TRANSACTIONS



Source: BAO Title Plant Transaction Log

(1) Be supported from the BAO using current BAO hardware and software.

(2) Be undertaken in the near-term where the need, ownership, and lease management workload is very high.

(3) Be supported with the budget necessary to train users, to begin the data conversion efforts, and to supply a remote terminal when the data communication need warrants its use.

Conclusion and Recommendations

The Investigative Staff concurs with these recommendations. Further, if the users' satisfaction of the Integrated Record Management System grows as their experience with the system grows, then the truth of the above supposition should be applicable to the other four title plants. The Investigative Staff strongly recommends that the BIA act on the BAO recommendations before expending any further resources on contracts similar to those discussed below. On May 11, 1977, BIA contracted with GSA Region 7 to do a current systems review on land records. The cost of this contract was $44,000. The results of the above study led to an additional contract on August 29, 1977, of $323,874 for the development, design, and implementation of a new Land Records Information System.

The Investigative Staff finds it difficult to understand why BIA's Headquarters management has chosen to ignore these recommendations and continues to pour money into the Land Records System. As noted earlier, BAO has expended $887,500 as of June 1976 for the development of an area land records system. Now, BIA is expending $367,874 (not to mention the fractional cost noted later in the Bureau ADP Requirements Study) for a bureauwide Land Records System. Another factor of importance noted is that since the Billings Area Office was chosen by BIA Headquarters for the development of the Land Records System as a pilot project, BIA should evaluate the results of the pilot project. In July of 1977, the BAO produced a report entitled "Evaluation of the Integrated Records Management System in the Billings Area," which in the opinion of the Investigative Staff, shows the success of the pilot project. The Investigative Staff strongly recommends that BIA's Headquarters and central management evaluate the recommendations of this report before proceeding to expend further funds for the Land Records Information System.

6. Need for Improvement in BIA Management Practices

The effectiveness of BIA in achieving the objectives and goals of its mission is being thwarted by its management deficiencies. Within the level of top management, the most pronounced problems are the high rate of turnover and a breakdown in communications. In short, this leads to a lack of leadership and the development of area offices as mini BIA's.

Other problems in management have to do with personnel. In the area of ADP, there is a great divergency between the skilled data processing professional and the unskilled data processing professional. This void has been created by the Indian Preference Act. Most of the skilled data processing professionals have left BIA with the result that the remaining few are spread too thin. The Indian Preference Act has also made it difficult to fill vacant positions with highly qualified people.

In an interview with a BIA official, the Investigative Staff was told that there is approximately a 70 percent turnover in top management from presidential administration to administration. This official further stated that the turnover in the offices of area directors is approximately 20 percent. The Investigative Staff asked the BIA official for verification of these statistics. His response was that all the Investigative Staff had to do was to take a look at the number of commissioners that the BIA has had in the past 10 years. Likewise look at the changes in the ranks of Directors that had responsibility for offices within the BIA organization. This turnover is substantiated in part by the January 1977 GAO report. It states:

> "Concerning the turnover in the Director's position (Office of Education), BIA records showed that, during the 10-year period 1966-76, 15 different people held either the position of Director or Acting Director. The average length of time each person spent in office was about 7 months."

The result of this turnover in personnel is a series of discontinuities, i.e., plans that are formulated at Headquarters or the central office are not communicated to the field.

With respect to communication, the 1977 GAO report states: "* * * formal instructions had not been issued to area offices

and schools to deal with the findings and conclusions in our 1972 report." This statement permeates the BIA correspondence shown to the Investigative Staff.

The end result of this problem is that the area offices tend to become autocratic--they become "little BIA's." This statement is exemplified in a September 21, 1976, DOI audit report to the Commissioner, Bureau of Indian Affairs. The title of the report is "Preinstallation Review of the Indian Information System at the Billings Area Office," and it states on page 5: "We believe that BAO has significantly exceeded the (DOI/BIA) approved perimeters of the pilot project." The American Indian Policy Review Commission noted in its Report of September 1976 on page 25: "BIA internal communications are poor and the absence of two-way communications for transmittal of vital data seriously impedes the effectiveness of the bureau. Information filters down from the central office to area and agency operation, but it is not discussed--it is imposed."

At the agency level, turnover in personnel is only 1 percent per year. Unfortunately, the concepts of management observed by the Investigative Staff are antiquated. Procedures that were established 20 years ago for processing Indian requirements are still in practice today. These procedures are encumbered with red tape and cause only irritation among Indians who seek fulfillment of their requirements. Consequently, they circumvent the system. An interesting observation on the part of a BIA official is that this circumventing has led to the enactment of the Indian Self-Determination and Education Assistance Act.

Indian Preference

"Mechanical capacity alone will not solve BIA's data processing problem. In addition, an adequate number of trained personnel with experience in computer languages, operating systems, programming and applications must be employed immediately. Indian Preference may present difficulties since data personnel are in high demand and command good salaries. Also, qualified software people are not attracted to Albuquerque which has limited employment opportunities. They prefer areas where they can easily move from one employer to another. Therefore, the location of the bureau's facility in a city which has other large data processing centers could improve the situation." American Indian Policy Review Commission--page 35.

The Investigative Staff agrees with the above assessment particularly with "* * * Indian Preference may present difficulties * * *" The Investigative Staff in its field interviews was repeatedly told that there is a tremendous need for qualified

people. As one BIA official stated; "BIA management and the Indian Tribes want qualified people, be they Indians or not." However, because of the decision made in the Freeman, et al, versus Rogers C.B. Morton, Secretary of the Interior, et al, 499 Fed. 2nd 494 (1974), that all personnel actions are governed by Indian Preference, it is difficult if not impossible to carry out merit promotion and hiring. The report by the American Indian Policy Review Commission on page 24 bears this out:

"Indian preference has a profound effect on BIA personnel management. Congress intended that the Indian Service shall gradually become a service predominantly in the hands of educated, competent Indians. However, no one in 1934 realized just how gradual this process would be. Even now, 43 years later, many positions are virtually impossible to fill because qualified Indians have not been located.

"Bureau morale suffers because of Indian Preference: Many non-Indians either leave BIA or are minimally motivated to perform because of Indian competition. The failure of bureau personnel to understand Indian Preference has led to inconsistent administration of the policy at all levels. The failure is especially evident in the attempt to select Indian candidates for every vacancy--a practice which results in unfilled and downgraded positions. The result is a significant reduction in BIA effectiveness. Internal mobility and flexibility also suffer because in many instances, non-Indians cannot be transferred to new positions. There is a basic dichotomy between interpreting Indian preference as an Indian employment, training, and development vehicle and the BIA charter to serve the Indian people effectively."

Conclusions and Recommendations

The success of an organization depends upon the people who occupy the various levels of management throughout the organization. In the case of BIA personnel, top management is very transient. Consequently, its good planning is seldom implemented.

The Investigative Staff recommends that the Secretary of the Interior establish a task force to define the cause for the lack of continuity in BIA top management and to present a solution to correct this grave problem.

Because of the lack of continuity in top management, there is no strong leadership in BIA. This is one of the causes of low morale throughout the bureau. Another, far more prevalent than the former, is the Indian Preference Act. Because of it, positions within the bureau go unfilled, since qualified Indians

cannot be found to fill the vacancies. As a consequence, the gap between the skilled and the unskilled employee widens. Those skilled employees who remain are spread too thin, and the unskilled are put into positions beyond their level of expertise.

7. ADP Modernization Plan to Solve BIA's Problems

The solution to BIA's problem for timely and accurate management information is its ADP Modernization Plan. Phase one of the plan is to solve immediate problems and phase two is to solve long-range problems.

The Investigative Staff spent considerable time with Headquarters, central office, and area office personnel to determine the validity of the ADP Modernization Plan. The Investigative Staff received full cooperation from all of the personnel interviewed. They seemed competent in the functions that they performed. Unfortunately, these people were basically one deep, that is, they have very few experienced people under them in order to achieve the objectives and goals of their functions. Reasons for lack of expertise were considered under the section "Need for Improvement in BIA Management Practices."

Headquarters and central ADP management have recognized for a long time, the lack of information furnished to office and area directors and agency superintendents. In an attempt to deal with this need, BIA, in concert with DOI ADP management, has developed an ADP modernization plan. This plan has two phases. Phase one is to acquire modern ADP equipment and phase two is to design and implement systems that will satisfy the functional needs of the entire bureau.

Phase one of the plan proposed that BIA acquire a modern computer with telecommunication capabilities; the Linolex terminals that are currently in the area offices would preprocess and transmit data and receive data from the host computer in Albuquerque. The applications planned for the new system were to be a conversion of all the current administrative and functional applications from the CDC 3150 and CDC 3170. The conversion cost of translating each line of code in all the programs to ANSI COBOL 74 is estimated at $300,000.

The Investigative Staff recommends that BIA not spend money to convert systems that are made up of patchwork programs and routines. Problems that exist in the current applications are not going to be resolved by converting antiquated lines of code to modern ANSI COBOL. Therefore, the funds would better be served in the design of entirely new systems. In short, if the BIA has lived with most of these systems over the past 10 years, it can continue to do so until the new systems are designed and operational.

The intended effects of the new hardware system, if acquired, would be to reduce the processing time and increase the throughput time. The use of the Linolex terminals would reduce the data entry time and the data output time for payroll, personnel, financial and inventory information as well as land records, tribal enrollment, and education.

The FY 1977 ADP budget of $3,800,000 provided funds for this part of the plan. It had all the proper sanctions of DOI, OMB, GSA, and the Congressional Committees. In view of these approvals, BIA prepared a Request for Proposal (RFP) in November 1976. BIA conducted all of the benchmark studies with great propriety. On conclusion of the study, BIA was going to make its award on August 15, 1977. However, Chairman Yates on learning of this proposed award and in view of the current investigation and in accordance with House Report 95-392, recommended in his August 4, 1977, letter to Secretary Andrus that "* * * it would appear prudent to delay any further computer acquisition in the Department until the investigations are completed and hearings are held." Of the five points the Investigative Staff is to assess, two are related to the moratorium: (a) the need of BIA for a separate ADP system; and (b) the accuracy of present cost estimates for future ADP expansion.

The Investigative Staff is of the opinion that the BIA has been overcautious in defining its computer requirements so much so that the machine it planned to acquire could not have fulfilled all of its requirements. This could be contrasted with that of the Bureau of Land Management, which oversized its initial requirements.

The Investigative Staff reviewed BIA's estimates for FY 1976, TQ, FY 1977, FY 1978, and for its short-term upgrade and found it to be overstated as to the cost of ADP equipment and materially understated with regard to its personnel cost.

BIA is preparing another set of estimates for Teleprocessing Services Programs (TSP) both within DOI and outside. BIA is doing this by submitting samples of their requirements to the Bureau of Reclamation, Bureau of Land Management, Bureau of Mines, the DOI Washington Computer Center, and to nine of the TSP vendors on the GSA approved list.

Regardless of where the central or host computer is located, BIA will have to develop Phase Two of the ADP Modernization Plan. The purpose of Phase Two is to redesign the current administrative and functional applications that are run on the CDC computers and to design the remaining applications that have been identified in the Bureau-Wide ADP Requirements Study (BARS).